Evaluating Post-Acute Home Care Outcomes

In Partial Fulfillment of the Requirements

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by

Robert Nesdole

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Overall Abstract

Aggressive hospital discharge policies adopted in the 1990s led to an influx of patients recovering from acute illness accessing post-acute home care services. These policy decisions also led to a shift in emphasis from supportive preventive long-term home care to post-acute home care. In light of the increasing number of patients discharged early from hospital to home care, this study examined post-acute home care services in the Saskatchewan health region studied. Home care in Saskatchewan will assist in the development of stronger primary health care through alignment with the goals of the provincial Surgical Initiative by expanding services to support post-acute clients at home and in the community. However, in order to support the Saskatchewan Surgical Initiative there is a need for greater understanding of the efficiency and effectiveness of post-acute home care.

In response to a need for a deeper understanding of post-acute home care performance and quality the post-acute Direct Services Home Care program in the Saskatoon Health Region was examined using formative program evaluation methodology for the purpose of making mid-stream modifications to improve program effectiveness. A summative approach, which involves making judgements about the efficacy of a program, was not conducted as the post-acute Direct Services Home Care program is ongoing. Therefore, the focus of the research was: 1) assess the extent to which post-acute home care is meeting its program principles, objectives and service goals; 2) compare client and nurse provider ratings of post-acute home care quality; 3) identify factors contributing to client and nurse provider ratings of post-acute home care quality; 4) determine client factors contributing to length of care to improve the delivery of services; and 5) determine the effect of unexpected health symptoms/complications and infection on total care hours among post-acute home care clients receiving wound care. This was accomplished using: survey data collected from home care clients and nurses at three time points, home care administrative data, and a review of nursing charts for post-acute home care clients receiving wound care.

Home care clients in the health region were introduced to this research by scheduling staff who

provided information while arranging required care visits. Potential participants were informed that home care in the health region was conducting a study using client surveys at three separate time points, administrative data and nursing chart reviews and they may be asked to participate in this research. To obtain consent and conduct client interviews a single evaluator contacted post-acute home care clients by telephone using a standardised script. During the telephone interview home care clients indicated their willingness to participate or their decision to withdraw; in cases where clients wished to participate but were physically unable, a proxy respondent (i.e., spouse, primary caregiver, or family member) was used.

Brief surveys, for clients and nurse providers, captured: care objectives and service outcomes; patient-centeredness; trust in providers; health improvement/decline; emotional/social functioning; functional status; injury avoidance; and overall quality. For clients, perceptions of quality were significantly affected by patient centeredness and experiencing unexpected health complications, which accounted for 83.0% of the variation. For nurse providers, overall quality of care provided was significantly related to patient centeredness, service outcomes, team communication and injury avoidance. Analyses revealed that for clients with complex needs, the service period could be extended from 60 days to 97 days which would cover 50.0% of clients.

The research using administrative data predicted the dependent variable Log of Total Care Hours (TCH) to enable analysis using General Linear Modelling. The results showed post-acute home care clients referred from Emergency Departments received approximately 84.2 % more TCH; post-acute home care clients referred from Surgical wards received approximately 42.1% more TCH; and post-acute home care clients referred from Cardiology received approximately 66.3% more TCH than clients referred from the community. Furthermore, single clients received more TCH than married clients.

Nursing chart reviews of post-acute home care clients with wound care also predicted the Log of TCH to enable analysis using General Linear Modelling. Post-admission, 11.3% of post-acute home care clients receiving wound care displayed clinical signs and symptoms of possible infection, while 19.7% displayed clinical signs and symptoms of acquired infection. Post-acute home care clients with wound care who experienced a one unit increment increase in injury, trauma or harm while admitted to home

care received approximately 53.3% TCH; and Post-acute home care clients identified to have acquired an infection using clinical signs and symptoms after being admitted to home care received approximately 70.2% TCH. The results suggest a need for electronic charting using tablets to increase consistency, accuracy and reliability.

The implications of this research suggest there is room to improve post-acute home care services to address client re-hospitalisation, unexpected health symptoms/complications, and wound care. Differences between client and nurse provider reports of hazards in the client home and established safety plans suggest nurses may not be effectively communicating with their clients. This suggests a need to foster, nurture and develop a culture of patient centered care, as discussed in the 2009 Patient First Review, through providing home care nurses with additional training directed towards improving client communication skills, thus increasing overall home care quality ratings.

It is also important to implement an electronic health record system with integrated client charting that requires nurses to report client information in real -time at the point of contact. However, this cannot be accomplished without reconceptualising how home care is delivered. To start, removing impediments to providing quality care and real -time reporting means home care must develop strategies and methods to support nurses in the community. There is a need to establish a direct line of communication for nurse providers to access support when encountering difficult situations. Moreover, developing appropriate pathways for nurse providers to communicate will address the wider goals of patient centeredness, quality of care and stewardship of resources within the philosophy of continuous improvement, as well as contribute to the full integration of home care in the mix of services provided to patients in Saskatchewan health regions.

Improving quality of post-acute home care also necessitates nurturing a positive work environment and culture. This requires a greater level of engagement from nurse managers and educators. Increasing the level of engagement with home care staff will encourage cross-communication within and between home care managers, educators and nurse providers who independently deliver care in the community and help to breakdown health care silos. Fostering communication and a positive work

environment also creates a culture of transparency leading to solutions for systemic problems, and shepherds greater integration of home care with primary health care. Further, it also demonstrates commitment to staff, clients and the greater community.

Last, there is a need to develop standardised charting protocols starting with the identification of client and family members, nurse providers, home care administration, and primary care facility needs. Accordingly, it is important to develop methods to accurately convey health related data in client charts to ensure understanding of the care process and facilitate proper outcomes of quality and safety. However, developing standardised protocols for charting patient data requires the implementation of processes to identify changes in the care environment and methods for continuous improvement. Moreover, it necessitates the use of standardised evaluative tools. In the context of post-acute home care, this means obtaining the necessary licensing to use the interRAI Acute and Post-Acute Care system (InterRAI, 2014).

Home care in Saskatchewan needs to redesign itself to accommodate the vision of patients and clients as an integral component to quality improvement. The challenge in doing this, for home care, is to thoroughly define and identify ways to facilitate the smooth transition of clients from primary care facilities to community while accommodating growing numbers of clients with complex care needs from institutions. Effectively accommodating clients in the community recovering from acute illness or hospitalisation would allow home care to increase its value to the health care system without increasing overall expenses. This cannot be accomplished without more robust accountability frameworks to support the growing importance of home care within the context of primary care delivered in Saskatchewan.

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Chapter 1

Introduction

Aggressive hospital discharge policies adopted in the 1990s, to attain public sector cost-savings, have led the Canadian healthcare system to become increasingly reliant on home care services (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; Premiers Council of Canada, 2002; Jackson, 1994; Hollander, 1994; Jacobs, Hall, Henderson, Nichols & 1995; Coyte & McKeever, 2001; Woodward, Abelson, Tedford, Hutchison & 2004; First Ministers of Canada, 2003). However, there is currently a paucity of research examining the quality and performance of home care in Canada with the majority of research focusing on the use of resident assessment instruments for home care to describe and compare quality indicators and identify adverse events, as well as factors associated with risk of Emergency Department visits and hospitalisation (Doran et al., 2009; Doran et al., 2013; Mofina & Guthrie, 2014; Doran et al., 2013b). To improve patient centered care in Canada, a deeper understanding of home care and its existing strengths and shortcomings is needed; this will serve to align home care policies and practices within the philosophy of continuous improvement. Increased research is also needed to facilitate the full integration of home care into the mix of services provided to patients in Canada.

1.1 *Quality and performance assessment in healthcare*

A perception held by the general public, that inadequate value is received for the money and effort invested in healthcare, has contributed to increasing attention directed towards performance measurement and quality assessment (Auditor General of Canada, 2002; Canadian Home care Association, 2004; Canadian Home Care Human Resources Study, 2002; Flood & Choudhry, 2002; Laporte, Coyte & Cruxford, 2002). Two findings have contributed to this belief: Over the last 30 years the cost of healthcare has almost doubled for industrialised nations; and greater financial investment in healthcare does not always yield better results (Anderson, Rinhardt, Hussey & Petrosyan, 2004; Organizational for Economic Cooperation and Development, 2004; Retzlaff-Robert, Chang & Rubin,

2004). Consequently, many people perceive major flaws in the healthcare system and believe that improvement needs to come from both within and outside healthcare (Department of Health, 1997; Institute of Medicine, 2001; Leatherman & Sutherland, 2004; McGlynn, Asch, Adams, Keesey, Hicks, DeCristofaro & Kerr, 2003).

In light of these concerns, performance and quality assessment of healthcare have become paramount to policy makers and health service researchers worldwide (Arah, Klazinga, Delnojj, ten Asbroek, & Custers, 2003; Johnston, 2004; Murray & Evans, 2003; Smith, 2002). Accordingly, incentives to evaluate the performance of healthcare systems are common practice (Hollander, 1994; Jackson, 1994; Premiers Council of Canada, 2002; Saskatchewan Ministry of Health, 2010). The international agencies: Organization for Economic Co-operation and Development (OECD) and the World Health Organization (WHO) are particularly influential in encouraging performance measurement within health systems (Conrad & Christianson, 2004; McLoughlin, Leatherman, Fletcher, Owen, 2001; Roland, 2004).

Numerous countries routinely use performance measurement for quality improvement in healthcare (Conrad & Christianson, 2004; McLoughlin, Leatherman, Fletcher, Owen, 2001; Roland, 2004; Rosenthal, Fernandopulle, Song & Landon 2004). This has resulted in a variety of theoretical frameworks being developed to create accurate performance measures (OECD, 2004). However, the lack of a universally accepted performance measurement framework makes it difficult to evaluate and compare results obtained across health systems (OECD, 2004).

The OECD defines quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (OECD, 2004)**.** Accordingly, when assessing quality of care provided, it should be understood that quality health care will produce desirable patient outcomes; the preference for different treatment options will vary by patient; and factors beyond the control of individual providers will influence final health outcomes (Arah, Westert, Hurst & Klazinga, 2006). In addition, healthcare systems vary in their response to the challenge of maintaining quality within the structure and responsibilities of

managing the social determinants of health (Mattke, Epstein & Letherman, 2006).

When evaluating quality in healthcare it is important to examine the dimensions of healthcare performance that can be defined, are measurable, and that measures are practical and relevant to the purpose of maintaining, restoring or improving health (Kelly & Hurst, 2006). The Institute of Medicine (IoM) has identified the following six dimensions through which quality is expressed: safety, effectiveness, patient centeredness, timeliness, efficiency, and equity (Institute of Medicine, 2001; Mattke, Epstein & Letherman, 2006). Safety is defined as the degree to which healthcare processes and treatments avoid and amend adverse outcomes or injuries resulting from care received (National Patient Safety Foundation, 2000). Safety is closely related to effectiveness but its focus is on the prevention of untoward events. Effectiveness is the degree to which desirable outcomes are achieved (Arah, Klazinga, Delnojj, ten Asbroek, & Custers, 2003; WHO, 2000). When evaluating effectiveness of care it is important to examine the extent to which attainable improvements in healthcare have been made (Donabedian, 2003). Patient centeredness is the degree to which care provided is respectful and responsive to individual needs and values (OECD, 2004). The Agency for Healthcare Research and Quality (AHRQ) in their 2010 National Healthcare Quality Report defines timeliness as the ability to provide care promptly after a need is recognized (AHRQ, 2010). As such, measures of timeliness include wait times and the interval between identification of care needs and receiving care (AHRQ, 2010). Efficiency is the ability of the system to appropriately use available resources to yield maximum benefits or results (AHRQ, 2008). This dimension of quality is measured by the ability of the system to function at lower cost without affecting the desired outcome or results (Shapiro, 2000). Equity refers to the absence of systematic disparities in health or the social determinants of health between groups with different socioeconomic groups (Donabedian, 2005). Evaluation of the literature on quality also suggests accessibility should be included as a dimension of quality Mattke, Epstein & Leatherman, 2006).

Avedis Donabedian (2005) defines the assessment of quality in health care as the process of making a judgment on the goodness of healthcare, based on one or more of the following aspects of care: the expected or realized ability of care to achieve the greatest improvements congruent with current

healthcare science and technology; acceptability to patients (including families); and acceptability to the community (or the society at large). Consequently, quality assessment is a cyclical process that begins with information about the performance of a healthcare system leading to system changes which are then re-evaluated for quality (Donabedian, 1986). The determination of whether or not healthcare has been good can then be made through the assessment of structural, process, and outcome measures (Donabedian, 2005; Roemer & Montoya-Aguilar, 1988). Outcome indicators look at the degree to which care provided is acceptable and has attained improvements in health (Donabedian, 2005). Process indicators evaluate whether or not what is done for patients corresponds with what is known or believed to be most effective in improving health and is most acceptable to patients and society (Donabedian, 2005). Structural indicators allow assessment of the degree to which organizational and physical environments where care is provided are conducive to the kind of care that can be expected to improve health and is acceptable to patients and communities (Donabedian, 1990; Donabedian, 2005).

Medical care outcomes can be defined in terms of recovery, restoration of function and survival (Donabedian, 2005). When using outcome measures to assess quality there are a number of factors to consider. First, whether or not the outcome of interest is relevant needs to be determined. This is because outcomes are the result of two factors, the ability of healthcare to achieve results under any condition and the degree to which the provision of healthcare has been applied (Donabedian, 2005). Second, outcome measures used do not always have clear definitions, making them difficult to quantify. Particularly patient attitudes towards satisfaction, social restoration, physical disability and rehabilitation are more difficult to measure (Kelman, & Willner, 1962). Moreover, conceptualisation of an outcome as an absolute does not allow for variance in the outcome to be expressed (Donabedian, 2005). Also an over-reliance on outcome measures does not provide information regarding deficiencies and strengths in care provided (Donabedian, 2005). Third, the face validity of criteria identifying success or failure is not completely clear for many outcome measures (Donabedian, 2005). The difficulty in evaluating outcomes among home care clients is their health status depends on the underlying condition, comorbidities, and the home environment where service provision takes place. Since clients receive home care to alleviate a spectrum

of problems, it is difficult to infer that better quality is associated with better outcomes.

Process measures help to identify aspects of care that are problematic and therefore can be readily translated to recommendations for quality improvement (Donabedian, 2005). Process measures are a necessary supplement to outcome measures when evaluating the quality of care provided (Kramer, Shaughnessy, Bauman & Crisler, 1990). In fact, among patients with outcomes that are difficult to define (e.g., those who are terminally ill or have chronic conditions) process measures are preferable for evaluating quality of home care (Kramer, Shaughnessy, Bauman & Crisler, 1990). However, process measures require standards and/or guidelines to which patient care can be compared (Kramer, Shaughnessy, Bauman & Crisler, 1990). The difficulty presented by quality assessment in home care is the standards used to develop process measures are frequently global in their application and require subjective input from the healthcare professional (Kramer, Shaughnessy, Bauman & Crisler, 1990). As a result, incorporation of process measures to assess quality of home care should focus on the selection of process measures related to key attributes of care provided which can be readily linked to specific outcomes (Kramer, Shaughnessy, Bauman & Crisler, 1990).

Structural measures are used to determine the availability and quality of resources, management systems, and policy guidelines vital to the maintenance of processes over time (Donabedian, 2005). They include guidelines on organizational structure and staff qualifications. Structural measures also include agency level procedures for admitting patients, record keeping, insuring confidentiality, dispensing pharmaceuticals and equipment maintenance (Kramer, Shaughnessy, Bauman & Crisler, 1990). When assessing the quality of home care it is therefore important to be judicious in the use of structural measures as an over-reliance can impose a heavy administrative burden that may detract from the provision of patient care (Kramer, Shaughnessy, Bauman & Crisler, 1990). It should, however, be acknowledged the current shift in emphasis to providing care at home and in the community rather than in hospital makes evaluation of quality difficult. This is related to the independent nature of home care service delivery, increasing complexity of home care services and lack of institutional support (Canadian Home Care Association, 2013; Fireman, Bartlett & Shelby, 2004; Johnston, 2004; McAllister, Black,

Griffin & Smith, 1986; Shaughnessy & Kramer, 1990; Smith, 1986). Consequently, there is a need to explore, develop and conduct research related to performance and quality assessment of home care programs and services.

1.2 *Home Care in Canada*

In Canada, the role of the federal government in healthcare is to assist the provinces and territories to carry out their mandates through fiscal contributions (Auditor General of Canada, 2002; Canadian Home Care Association, 2013). This has allowed the federal government to both direct provincial health policy and establish national principles for selected healthcare services within the Canada Health Act (CHA) (1985). The CHA provides five principles for provincial health insurance plans to follow in order to receive federal government funding. These include: comprehensiveness, universality, accessibility, portability and public administration; all of which apply to medically necessary hospital services, required physician services, and surgical dental services performed in hospital. The CHA (1984) also lists extended health care services, which include home care, as exempt from the five principles for provincial health insurance plans. Under the CHA (1984) the federal government can withhold fiscal contributions to individual provinces or territories, on a dollar-for-dollar basis, should they allow user fees or extra-billing for medically necessary hospital services or required physician care. However, this stipulation, designed to prevent user fees and extra-billing, does not apply to long term care provided by health regions or other institutions.

The federal government is also responsible for the direct delivery of healthcare and home care services to Aboriginal Canadians (i.e., First Nations, Metis and Inuit peoples), eligible veterans, inmates of federal penitentiaries and refugee protection applicants (Canadian Home Care Association, 2013; Health Canada, 2004). Acknowledging the role of home care in 1999, the federal government implemented tax credits and income tax deductions for home care clients (Retzlaff-Roberts, Chang & Rubin, 2004). The federal government, through Human Resources and Skills Development Canada, also offer an Employment Insurance Compassionate Care Benefit program for those choosing to provide

palliative care to family members (Bill C-44, 2012).

Home care in Canada consists of services encompassing health promotion and teaching, curative intervention, end-of-life care, rehabilitation, support and maintenance, social adaptation and integration and support for informal caregivers (Canadian Home Care Association, 2013). Traditionally, the purpose of home care has been to prevent, delay or substitute long-term or acute care alternatives to enable frail elderly clients and younger people with disabilities to remain independent at home or in the community (Canadian Home Care Association, 2008; Health Canada, 1999; Canadian Home Care Association, 2004). As a result, home care includes the provision of medical and social services, while encouraging and supporting informal caregivers and resources within the community (Canadian Home Care Association, 2004). The professional medical component includes nursing and rehabilitative therapies including provision of wound care, post-operative care, physiotherapy and occupational therapy to clients with increasingly complex medical needs (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; Health Canada, 1999; Canadian Home Care Association, 2004, Flood & Choudhry, 2002). The social service component of home care includes homemaking services (i.e., meal preparation, light housekeeping and laundry) and personal care (i.e., bathing, grooming, transferring and help with dressing) (Canadian Home Care Association, 2013; Canadian Home Care Human Resources Study, 2002). Consequently, an array of different providers and agencies offering a complex range of health and lifestyle enhancement services participate in the provision of home care (Coyte & Young, 1997; Minister of Public Works and Government Services Canada, 1999; Stewart & Lund, 1990); with a shared vision of preventing or reducing deterioration of health status and supporting independence in the community while also providing specialised rehabilitation services to clients following discharge from acute care hospitalisation (Canadian Home Care Association, 2013).

For patients discharged from an acute hospitalisation requiring specialised or rehabilitative services in their home while recovering, home care can be short- or long-term (Canadian Home Care Association, 2013). The Standing Senate Committee on Social Affairs, Science and Technology, defines post-acute home care as all home care services received within 30 days of discharge from hospital, lasting

up to three months (Kirby & LeBreton, 2002). Long-term, continuing or chronic care, on the other hand, is distinguished by on-going service provision to assist and support clients to remain in the community, avoid admission to long-term care facilities and/or situations where care provided does not fall into acute, rehabilitation, maintenance or palliative care categories (Saskatchewan Ministry of Health, 2010). As such, long term care is delivered to a wide range of patients of all ages, to persons who are mentally or physically disabled and to people with chronic conditions (Canadian Home Care Association, 2013). The distinction between post-acute and long term home care, however, is not always clear and some patients fall under both classifications.

At present, each province in Canada provides similar post-acute and long term home care services. For example, services offered by home care include: client assessment, case management, nursing services, home-making and personal support (Canadian Home Care Association, 2013; Health Canada, 1999). The wide range of services provided and eligibility for home care services is based on patient need and available resources. However, lack of standardised data definitions and collection methods make reporting valid comparisons across Canada a challenge (Canadian Home Care Association, 2013).

1.3 *Increasing demand for Canadian home care*

Increasing demand for home care in Canada has been attributed to several factors: technological advancement, changing demographics, patient preference, and presumed cost-savings of home care in comparison to hospital care (Canadian Home Care Association, 2002). A growing Canadian senior citizen population has also contributed to the increasing demand for home care (Canadian Home Care Association, 2013; Statistics Canada, 2010) as seniors (particularly those ages 85 and older) are the primary consumers of home care services (Kirby & LeBreton, 2002). Demand for home care has also been influenced by the widely held belief that people prefer to receive medical care in their homes rather than in institutional settings (Canadian Home Care Association, 2013; Saskatchewan Ministry of Health, 2010). However, it should be noted that variation associated with preference for home care exists

according to privacy, comfort, invasiveness of procedure, and availability of gender specific staff to accommodate individual preferences (Sanober, Motiwala, Flood, Coyte & Laporte, 2005).

Reliance on home care in Canada has also been influenced by the idea cost-effectiveness can be obtained through providing services to patients in their homes rather than in hospitals (Coyte & McKeever 2001; Hollander, 1994; Jacobs, Hall, Henderson & Nichols, 1995). The belief that home care services provide cost savings is supported by Hollander and Chappell (2002) who reported long-term home care is 40% to 75% less costly than equivalent care in healthcare facilities. It should also be acknowledged that policy decisions in the 1990s, based on the belief cost-saving can be realised through the provision of services to patients at home rather than in hospitals, has led to an increasing reliance on home care services (First Ministers of Canada, 2003). Consequently, it is unclear whether cost-savings can solely be attributed to increased home care use; as savings are determined through the assessment of outcomes and cost-of-care (Sanober, Motiwala, Flood, Coyte & Laporte, 2005).

Other factors contributing to growth in home care expenditure include: expanding patient eligibility; increased accessibility; changes in technology; health system restructuring; and an aging population. Growing expenditure on home care is also related to services becoming increasingly sophisticated (Canadian Home Care Association, 2013; McAllister, Black, Griffin & Smith, 1986; Shaughnessy & Kramer, 1990; Smith, 1986). However, in response to the growing demand for home care services, federal and provincial governments have not adequately increased funding for home care or developed sound home care policies (Sanober, Motiwala, Flood, Coyte & Laporte, 2005). This is further complicated by the fact that each of the provincial and territorial governments are at different stages in development of their home care programs (Canadian Home Care Association, 2013; Coyte & McKeever, 2001; Sanober, Motiwala, Flood, Coyte & Laporte, 2005).

Increasing demand for home care in Canada has also created a greater need to monitor quality and evaluate performance of home care (Fireman, Bartlett & Shelby, 2004; Johnston, 2004). This is related to the rising cost of care, large variations in practice, medical errors, injuries resulting from care, lack of fiscal accountability and system inequities (Premiers Council of Canada, 2002; Coyte & Young, 1997;

Minister of Public Works and Government Services Canada, 1999). Utilisation of staff with varying degrees of training, which may affect the ability to provide care to clients with complex needs and varying functional abilities, has also led to increased need for quality assessment in home care (Kirby & LeBreton, 2002).

1.4 *Saskatchewan home care*

In Saskatchewan, home care falls under the Ministry of Health. The role of the Saskatchewan Ministry of Health is to provide policy direction, standards and legislation throughout the province (Canadian Home Care Association, 2013). It also provides consultative/advisory services to the regional health authorities (RHAs) and monitors service delivery. In its provincial role the Saskatchewan Ministry of Health also provides global funding to manage and deliver health care programs and services to RHAs (Canadian Home Care Association, 2013). The mandate of home care in Saskatchewan is to provide supportive, palliative and acute care to people in need so they can remain independent at home while in the community (Canadian Home Care Association, 2013). The principles of home care in Saskatchewan reflect the belief that: people retain greater independence and control over their lives in their home; and, the majority of people prefer to receive required services at home, supplemented by other health and social service programs. Consequently, home care services should support families and assist people to retain their independence and avoid unnecessary dependencies; make decisions according to assessed client need and risk; include individuals and their caregivers in case management and the identification of care needs; treat clients with kindness, dignity and respect according to their cultural values; and respect client decisions to accept or refuse service (Canadian Home Care Association, 2013).

The objectives of the Saskatchewan Home Care program are to: help clients maintain independence and well-being at home; support appropriate use of health and social services; effectively use resources to meet the needs of clients; and optimize client independence while working cooperatively with associated community agencies, organizations and individuals (Canadian Home Care Association, 2013). The goals of maintaining independence in home and community are accomplished through:

assessment of care need and the development and coordination of care plans; teaching self-care and coping skills; improving, maintaining or delaying the loss of functional abilities; promoting and supporting informal caregivers; and providing palliative, supportive and acute care (Canadian Home Care Association, 2013).

Encouraging appropriate use of health care services is accomplished through: preventing or deferring admission to long-term care facilities and assisting clients on discharge from hospital; supporting persons waiting to be admitted to long-term care facilities; preventing or reducing hospital admission and facilitating early discharge; assisting individuals and their informal caregivers to access needed services; promoting volunteer effort and educating the public about home care; and participating in regional service planning and coordination (Canadian Home Care Association, 2013). Effective resource use is facilitated by case coordinators responsible for assessment, care planning and case management, as well as utilisation of management approaches designed to avoid duplication of service and provision of appropriate care (Canadian Home Care Association, 2013).

The five year strategic priority of the health care system in Saskatchewan is to achieve "*Better Health, Better Value, Better Care, Better Teams*" by improving access and connectivity in primary health care innovation sites, emphasis on patient and staff safety and improving access and patient flow (Canadian Home Care Association, 2013; Regina Qu'Appelle Health Region, 2013). The strategic priority of the healthcare system in Saskatchewan will also transform the patient experience through "*Sooner, Safer, Smarter Surgical Care*" by strengthening patient centered primary care through improving continuity and access to specialists, through pooling referrals and creating an online Specialist Directory to tailor referral options, and providing information on length of wait time to see specialists (Government of Saskatchewan, 2014). Safer surgical care has been addressed through the implementing surgical safety checklists, surgical site infection prevention protocols, identifying factors that can contribute to falls and examining the root cause of errors with the goal of preventing medical errors before they arise (Government of Saskatchewan, 2014). Health regions in Saskatchewan have also developed patient pathways to streamline the care process and ensure patients receive care that is timely

and appropriate, as well as creating shared decision making tools to support patients in making treatment decisions (Government of Saskatchewan, 2014). Health regions in Saskatchewan have also adopted Lean Management Systems to support continuous improvement that looks to identify waste, eliminate activities that do not add value and encourage regular team meetings; enabling staff to problem solve in real -time (Government of Saskatchewan, 2014).

Regional Health Authorities in Saskatchewan provide coordinated access to long-term care, respite, adult day programs and home care through a single entry system where clients can be referred directly from hospital or the community (Canadian Home Care Association, 2013). As such, Saskatchewan Home Care programs support the Saskatchewan Surgical Initiative through expanding services to support seniors at home and in the community and individuals requiring post-acute care, discharged early from hospital and referred to home care.

Home care services in Saskatchewan are provided in a variety of settings which include clinics, group homes, personal residences, hospice, nursing homes, on-reserve lands, places of work, personal care homes, schools, as well as to homeless people on the street; under an integrated model of care that is patient centred, community designed and delivered by teams. Characteristics of the integrated model of primary healthcare in Saskatchewan include: interdisciplinary team based care; collaborative practice; integration, improved collaboration and communication between health professionals; technology to promote enhanced access; and provision of 24-hour telephone health information.

Despite the limitation pertaining to client care groupings within the Home Care program in Saskatchewan, to promote quality and accountability the Ministry of Health works with RHAs to share data regarding home care service: acceptability, accessibility and appropriateness. Acceptability measures include: services provided to home care clients; care concerns; and home care clients and units served by RHA (Canadian Home Care Association, 2013). Acceptability measures include: home care clients by care type and RHA; home care service ratios by care type; and distribution of home care services. Indicators of appropriateness of service include: distribution of home care services; audited home based service expenditures; home care spending by region; and home care units of service per client by age

group (Canadian Home Care Association, 2013).

1.5 *Addressing the challenges facing home care in Saskatchewan*

At present, home care in Saskatchewan is faced with both opportunities and challenges. Through the Saskatchewan Surgical Initiative, home care assists in the development of stronger primary health care teams by expanding services to support post-acute clients at home and in the community. In order to support the Saskatchewan Surgical Initiative there is a need for greater understanding of the efficiency and effectiveness of post-acute home care. However, the ability to evaluate the existing post-acute Direct Services Home Care program is limited. Program goals are not clearly articulated; there is a lack of defined program outcomes and data to measure achievement of program goals; post-acute clients are not easily identified in administrative data; client health data reported in the nursing charts are not standardised and charts do not consistently convey client status or care needs; and steps taken to resolve problematic aspects of care are not recorded. Also, the post-acute Direct Services Home Care program only collects costing data on uninsured services and has no method to capture and examine quality of care or client outcomes from post-acute clients and their nurse providers.

Evaluation of the existing post-acute Direct Services Home Care program is also limited by the fact that nurse providers cannot be easily monitored by managers and nurse educators as they provide care in the community and lack of institutional support to address increasing complexity of home care client conditions and service needs (Auditor General of Canada, 2002; Canadian Home Care Association, 2013; Canadian Home Care Human Resources Study (CHCHRS), 2002; Fireman, Bartlett, &Selby, 2004; Johnston, 2004; Laporte, Coyte & Cruxford, 2002; Smith, 1986; McAllister, Black, Griffin, & Smith, 1986; Shaughnessy & Kramer, 1990). In addition, home care in Saskatchewan has not fully implemented the client groupings developed through the Canadian Institute for Health Information (CIHI) Development of National Indicators and Reports of Home Care (2004) project to enable comparisons between jurisdictions and categorise clients (i.e., Maintenance, Rehabilitation, Long-Term Supportive Care, Acute Care Substitution and End-Of-Life Care). Thus, comparisons between jurisdictions and

across provinces are not possible due to different regulations, guidelines and goals under which they operate (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008).

In light of current limitations in the post-acute Direct Services Home Care program, formative program evaluation methodology was used as it serves to foster real-time adaptations and refinements to improve the effectiveness of patient-centred care (AHRQ, 2013; Center for Disease Control, *n.d.*; McDavid, Huse, & Hawthorn, 2013). A summative approach, which involves making judgements about the efficacy of a program, was not conducted due to existing limitations in the available data, particularly administrative and costing information (AHRQ, 2013; McDavid, Huse, & Hawthorn, 2013). Therefore, the focus of the research became to: 1) assess the extent to which post-acute home care is meeting its program principles, objectives and service goals; 2) compare client and nurse provider ratings of post-acute home care quality; 3) identify factors contributing to client and nurse provider ratings of post-acute home care quality; 4) determine client factors contributing to length of care to improve the delivery of services; and 5) determine the effect of unexpected health symptoms complications and infection on total care hours among post-acute home care clients receiving wound care. To accomplish the goal of improving the effectiveness of patient-centred care delivered to post-acute home care clients in the Direct Services Home Care program (Appendix A) this research will use survey data collected from home care clients and their nurse providers at three time points, home care administrative data, and a review of nursing charts for post-acute home care clients receiving wound care to inform the development of adaptations and refinements designed to improve post-acute home care quality in the Saskatoon Health Region.

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1.7 Appendix A Direct Service Definition

Direct Service Definition:

- The clients are **noncomplex nature where the expectation is a return to a normalized state given the diagnosis and overall situation**
- Service is assessed to be required for **less than 60 days duration**

Note: This also applies to clients who may receive multiple services on a short-term basis

For example: post hip surgery who, *upon hospital discharge,* will require ***nursing*** *for a dressing change*, **home services** for ***a.m. care*** *for a couple of weeks and short-term*

It does not include:

- Clients with the following characteristics or a combination of characteristics may not be appropriate for Direct Service assessment. A longer service period is needed and a PASE assessment or RAI MDS-HC assessment may be required.
- For example:
    - Clients with progressive or unstable disease likely requiring frequent care plan changes
    - Clients with significant cognitive or behavioral issues affecting judgment and decision making regarding service provision or future care.
    - Clients who are assessed as coping poorly and likely to need frequent support
    - Clients without adequate or stable available support who require assist with care or decision making.
    - Clients requiring financial advocacy for chargeable services.
    - Clients of advanced age in combination with any of the above characteristics

Nursing Referrals with Eligibility for Extended Direct Service:

All clients must meet the criteria for the Direct Service with the exception of some nursing services which may require service beyond 60 days.

Examples of nursing referrals that may qualify for this exception:

1. HITP clients who require antibiotic therapy for:
    - chronic infections such as osteomyelitis
    - Vascular Access Device (VAD) care; includes PICC, central lines, Port access
    - Chemotherapy pump discontinuation (5FU)
2. Routine urinary catheter changes.
3. Medication injections, examples include:
    - Heparin/ Low molecular weight heparin
    - Iron dextran
    - Gold Salt Therapy
    - G-CSF
    - other specific injections that are safe to administer in the home

Chapter 2

Methodological Approaches

The focus of the research was to: 1) assess the extent to which post-acute home care is meeting its program principles, objectives and service goals; 2) compare client and nurse provider ratings of post-acute home care quality; 3) identify factors contributing to client and nurse provider ratings of post-acute home care quality; 4) determine client factors contributing to length of care to improve the delivery of services; 5) determine the effect of unexpected health symptoms complications and infection on total care hours among post-acute home care clients receiving wound care. The methodological approaches used were to use survey data collected from home care clients and their nurse providers at three time points, home care administrative data, and a review of nursing charts for post-acute home care clients receiving wound care.

2.1 *Sample*

This body of research used post-acute home care clients newly admitted to the Direct Services Home Care program from April 1st 2010 to Dec 31st, 2010 in the Saskatchewan health region studied, contacted during their first week of home care. Nurse providers who participated in this research, on the other hand, were a convenience sample, consisting of home care nurses who provided care to the home care clients, willing to complete study questionnaires.

2.2 Data sources

2.2.1 *Survey data*

Survey data was collected from post-acute home care client and their providing nurses at three points: during the first week of care, the mid-point of care, and during the last week of care. Client surveys were developed to collect data on the following aspects of care: Post-acute Home Care objectives and service outcomes; patient centeredness; trust in provider ability to deliver necessary care, service interruption; health improvement/decline; functional status; social/emotional status; and injury avoidance, using a Likert-Type response format. Client perceptions of the overall quality of post-acute home care

were captured using a 100 point scale ranging from 0 (i.e. *not at all*) to 100 (i.e. *perfect*). Similarly, surveys administered to home care nurse providers were also two pages. Post-acute home care nurse provider surveys were developed to collect data on the following aspects of care: care outcomes; post-acute home care objectives; patient centeredness; team communication, service interruption; health improvement/decline; client functional status; client social/emotional status; and injury avoidance, using a Likert-Type response format. Nurse perceptions of the overall quality of post-acute home care provided to their clients were also captured using a 100 point scale ranging from 0 (i.e. *not at all*) to 100 (i.e. *perfect*) as per Lepnurm et al., 2012.

2.2.2 *Nursing administrative data*

Nursing administrative data analysed were captured on post-acute home care clients participating in this body of research. The administrative data used in this research were captured longitudinally at each point of contact and included the following data fields: gender, visit date, visit duration, nursing service codes, income category, type of admission, level of care, type of care, hospital discharge, subsidy requested, type of housing, place of residence, support rating, diagnoses and discharge date. It should be noted administrative data quality presents concerns as it does not always adequately fit the needs of researchers (Iron & Manuel, 2007). Nevertheless, in healthcare, administrative data are routinely used for strategic planning, to investigate system driven questions and to improve health care programs.

The administrative data received was unbalanced panel data; therefore, had to be collapsed to enable data analysis of comorbidities, demographics, social support, and TCH. This resulted in summary variables for: days in care; number of nurses seen by each client participant; number of nursing visits; types of nursing services received; type of care received and TCH.

2.2.3 *Nursing chart data*

Post-acute nursing charts reviewed were specific to those home care clients receiving wound care agreeing to participate in this research. Nursing charts were created and maintained by Home Care Managers, Client Patient Assessment Services staff, Client Care Coordinators and Home Care nurses.

Charts reviewed did not include physician records or cross-sector health records. Nursing chart entries were recorded on a daily, weekly or monthly schedule according to the needs of each client participant. Client nursing charts reviewed contained the following information: client identifying data; reason for admission; identification of problems including diagnosis of disease and subsequent treatment; care plan; physician orders; social and nursing history when available; progress notes, flow sheets, assessment forms and nursing notes; and, where applicable, a discharge summary indicating the date and time of discharge, reason for discharge or cause of death, circumstances of discharge and person notified.

2.3 Article 1

The purpose of article one was to: 1) assess the extent to which post-acute home care is meeting its program principles, objectives and service goals; 2) compare client and nurse provider ratings of post-acute home care quality; 3) identify factors contributing to client and nurse provider ratings of post-acute home care quality;

2.3.1 *Survey design and development*

There is currently no available survey developed to measure the post-acute Direct Services Home Care program principles, objectives and service goals identified in the Saskatchewan 2006 Home Care Policy Manual from the perspectives of both post-acute clients and their nurse providers. Two similar survey instruments (one for the post-acute home care client and the other for their nurse provider) were examined to assist in the development of items: the Home Health Care CHAPS Survey (Agency for Healthcare Research and Quality, 2013) and the Next Steps in Care Home Health Agency Performance Self-Assessment Survey (United Hospital Fund, 2009). Following the examination of these surveys, items were developed in collaboration with the Home Care Director and Operations Manager in the health region studied. A two page survey was developed in consultation with the Nursing Manager of Operations and the Director of Home Care in the Saskatchewan health region studied. Survey items were developed to investigate the degree to which home care is achieving the mandate of providing quality care while keeping clients safe and independent in the community. Instruments were reviewed at six

incremental development stages by the Nursing Operations Manager and senior nursing staff.

Items were designed to capture client functional status and the following dimensions of quality: safety, effectiveness, patient centeredness, and timeliness. Scale metrics were designed using commonly understood adjectives conveying degrees of satisfaction, completion, safety and quality (Aday, 1996). Because people often disagreed on the severity of slightly and partially both adjectives were used in a seven point scale and in subsequent analysis recoded to five points (McDowell, 2006). Client surveys were developed to collect data on the following aspects of care: Post-acute Home Care objectives and service outcomes; patient centeredness; trust in provider ability to deliver necessary care, service interruption; health improvement/decline; functional status; social/emotional status; and injury avoidance, using a Likert-Type response format. Instruments were reviewed at six incremental development stages by the Nursing Operations Manager and senior nursing staff.

Client perceptions of the overall quality of post-acute home care were captured using a 100 point scale ranging from 0 (i.e. *not at all*) to 100 (i.e. *perfect*). Similarly, surveys administered to home care nurse providers were also two pages. Post-acute home care nurse provider surveys were developed to collect data on the following aspects of care: care outcomes; post-acute home care objectives; patient centeredness; team communication, service interruption; health improvement/decline; client functional status; client social/emotional status; and injury avoidance, using a Likert-Type response format. Nurse perceptions of the overall quality of post-acute home care provided to their clients were also captured using a 100 point scale ranging from 0 (i.e. *not at all*) to 100 (i.e. *perfect*) as per (Lepnurm et al., 2012).

2.3.2 *Procedures*

A longitudinal prospective cohort research design that spanned over eight months was used to evaluate the quality of post-acute home care services in the health region studied. Data were collected from clients and nurses at three different time points: the first week of care, the approximate mid-point of care, and the last week of care using similar survey tools developed for each time point. However, because home care service delivery does not permit continuity of nurse provider care the nursing data

were analysed cross-sectionally. Home care clients were introduced to this research through home care scheduling staff while arranging required care visits. At this time home care staff informed potential participants that home care in the health region studied is currently evaluating the performance and quality of its post-acute program to assess the quality of care and to identify care outcomes. Potential participants were also informed they may be contacted by phone and asked to participate in this research. A single evaluator collected client survey data by telephone using a standardised script during regular business hours. In the case where a client wished to participate but was not physically able, a proxy respondent (i.e., spouse, primary caregiver, or family member) was used.

Home Care nurses in the health region studied were introduced to this research through attending one of six brief information sessions, presented by the evaluator and the Home Care Director, held at the beginning and end of the workday. The purpose of these information sessions was to introduce the research to home care nurses and allow for questions and concerns to be addressed by the researcher and participating home care senior management. All nurse survey materials were distributed to full-time and permanent part-time home care staff via the individual client chart/information created for each client upon admittance to the post-acute Direct Services Home Care program. Surveys distributed to nurses providing care to client participants also included an information sheet indicating the research has been approved by the Behavioural Research Ethics Board. The nurse information sheet discussed their rights as participants and indicated they can withdraw their responses up to the point when the client participant is discharged from care or when the study is completed. In addition, the information sheet indicated when possible, surveys were to be completed by the same nurse at each point in time; during the first week of care, the mid-point of care, and during the last week of care.

Surveys were readily administered with no difficulties. During data collection nurse providers were continually engaged through newsletters information session and regular contact before shift and after shift. Participant anonymity was achieved by assigning home care clients and their attending nurses coded study numbers and having completed the surveys with no identifying information, returned in sealed envelopes with administrative paperwork. To ensure participant safety, if a home care client was

identified to be at risk of injury/suicide or experienced an untoward event while receiving home care the evaluator immediately notified the home care managerial team using appropriate administrative channels.

2.3.3 *Statistical analysis*

Survey data collected from clients and their nurse providers were entered into Excel by a single evaluator at each of the three survey times. Following the study period, the dataset consisting of client and nurse provider responses was transferred into SPSS 21 statistical software package. Data were cleaned and frequency distributions were used to identify variables containing out of range values. As both patient and nurse surveys were developed using insights gleaned from the literature on quality assessment, patient perspectives of quality and senior leadership of home care. Exploratory Factor Analysis (EFA) was conducted to examine face and content validity, explore dimensions in the instruments, and to facilitate the creation of composite scores. After identifying dimensions in both client and nurse instruments, scale score reliabilities (i.e., Cronbach's alpha coefficients) for each dimension were evaluated and the mean and standard deviation of dimensions identified as having a Cronbach's alpha greater than .60 were reported. Test-retest reliability was evaluated over three points in time with Cronbach's alpha coefficients; a measure of internal consistency (Tabachnick & Fidell, 2007).

Next, to determine the degree to which post-acute home care services in the health region studied are meeting principles, objectives and service goals, frequency analysis was run on the client data to identify the proportion of clients who reported unexpected symptoms/health complications, were hospitalised, contacted health services outside of home care, indicated their providing nurse identified hazards in their home and that they had a safety plan. The degree to which the post-acute home care program is meeting its principles, objectives and service goals was also investigated though examining home care client and nurse provider responses pertaining to unexpected complications/untoward events, hospitalisations, identification of hazards in the client home and a client established safety plan at each time point. Client wait time from admission to post-acute home care to first day of service was also examined using frequency analysis to determine the proportion of clients who received service within

48hrs of admission. In addition, the mean and standard deviation of post-acute home care service was examined to determine whether or not the existing program duration of 60 days or more for clients with complex nursing care is appropriate.

The proportion of post-acute home care client and nurse provider responses regarding unexpected symptoms/health complications, hospitalisation, identification of hazards, and client safety plans were then evaluated within each point in time to determine if they were significantly different. Next, client and nurse Injury Avoidance scale scores were also compared within each point in time to determine if they were significantly different. Repeated measures ANOVA was used to examine whether or not Client Functional Status and Injury to Avoidance ratings changed over time. Standard regression was then conducted using the post-acute home care client data to examine the effect of demographic variables on total days in care.

Last, factors contributing to client and nurse perceptions of post-acute home care quality were examined. Client data were analysed using General Linear Modeling (GLM) to account for repeated measures. Accordingly, four continuous predictor variables (i.e., Patient centeredness, Functional Status, Social/Emotional Status and Injury Avoidance scale scores) and two dichotomous predictor variables (i.e., Untoward Events/Health Complications and Hospitalisations) were employed; two of which, untoward events/health complications and Patient Centeredness, were retained. Nurse data, on the other hand were analysed using standard regression at each point in time. Five continuous predictor variables (i.e., Patient Centeredness, Communication, Service Outcomes, Client Functional Status and Injury Avoidance scale scores) were employed at each point in time.

2.4 Article 2

The purpose of article two was to determine client factors contributing to length of care to inform the improvement of delivery of services using post-acute home care nurse administrative data.

2.4.1 *Procedures*

A retrospective longitudinal cohort research design was employed to evaluate factors associated

with length of post-acute home care home care nurse administrative data. The home care nursing administrative data for all post-acute home care clients consenting to participate in this research was extracted by a home care Community Client Analyst. Following receipt of the home care nursing administrative data all client identifying information was removed. As the administrative data received was unbalanced panel data, the dataset was then collapsed to enable data analysis of comorbidities, demographics, social support, and TCH. Collapsing the administrative data resulted in the following summary variables: days in care; number of nurses seen by each client participant; number of nursing visits; types of nursing services received; type of care received and TCH. For safety, if a home care client was identified to be at risk of injury/suicide or experienced an untoward event during data collection, the evaluator notified the home care management team.

2.4.2 *Statistical Analyses*

Home care nurse administrative data were analysed to determine the effect of referral source, socio-demographic variables and comorbidities on TCH received by post-acute home care clients. Prior to analysis, frequency distributions were used to identify the percentage of missing data and to examine whether any variables contained out of range values. The results of these analyses identified 93.6% of post-acute home care clients did not have income category recorded and that 95.5% of the sample did not request subsidised care. As such, these two variables were excluded from data analysis using General Linear Modelling (GLM). Examination of referral sources revealed four post-acute home care clients referred from Gynecological and Obstetrics wards, one post-acute home care client referred from Oncology and Hematology, Psychiatry, and Rehabilitation. Six post-acute home care clients were referred following outpatient treatment. Four were referred from General Medicine, eight from Maternity and 12 referred to home care from the category ‘Other’ (i.e., General Medicine, Psychiatric and Ophthalmological wards).

The means and standard deviations of continuous measures were then calculated and TCH, the dependent variable, was evaluated to determine whether it was suited to analysis using GLM. The results

of this analysis suggested TCH was non-linear in nature; *skewness* = 2.735, *kurtosis* = 9.567. The Shapiro-Wilk test (1965) of normality also suggested TCH was not suited to linear modelling. Accordingly, TCH was Log transformed and retested to determine suitability for linear modelling. This analysis indicated a Log transformation of TCH normalised the dependent variable, Shapiro-Wilk = .990, *df* = 157, *p* = .331. Next, the categorical variable referral source was dummy coded to enable analysis examining the effect of referral source on TCH using GLM. General Linear Modelling was then conducted to test the effect of post-acute home care client sociodemographic variables on TCH individually. Due to sample size limitations, the effect of comorbidities on TCH were only evaluated using post-acute home care clients referred from the Community and Surgical wards. When evaluating the effect of post-acute home care client comorbidities on TCH, comorbidities were screened individually to identify all comorbidities found to have a p-value less than .25. Following identification of comorbidities with a p-value less than .25 the final GLM was developed using forward section.

2.5 Article 3

The purpose of article three was to determine the effect of unexpected health symptoms complications and infection on total care hours among post-acute home care clients receiving wound care.

2.5.1 *Nursing chart review*

Post-acute nursing charts reviewed were specific to those home care clients receiving wound care agreeing to participate in this research. Nursing charts were created and maintained by Home Care Managers, Client Patient Assessment Services staff, Client Care Coordinators and Home Care nurses. Charts reviewed did not include physician records or cross-sector health records. Nursing chart entries were recorded on a daily, weekly or monthly schedule according to the needs of each client participant. Selected nursing charts were examined in three separate stages. In the first stage of the chart review, all client participants receiving wound care were identified. In the second stage, each selected nursing chart was reviewed using screening criteria adapted from Sears, Baker, Barnsley and Shortt (2013) to identify unexpected health symptoms (Table 4.1). The third stage, to identify wound care clients with possible or

acquired infection using clinical signs and symptoms, was conducted by a nurse educator with extensive experience in leadership and instructional roles.

Definitions and methods for the surveillance of nosocomial infection used in hospital settings cannot easily be applied to home care because they rely heavily on laboratory data (Rhinehart, 2001); while in home care, clinical diagnosis of infection is formed using observed information with reliance on physical signs and symptoms (Rhinehart, 2001). The nurse educator utilised her extensive experience and knowledge of nursing services to summarise and identify possible infection and acquired infection using clinical signs and symptoms found on wound care flow sheets and within the nursing charts. The clinical signs and symptoms used included: fever, new antibiotic order, purulent drainage from a wound, change in colour or odour of urine, change in consistency or colour of sputum, respiratory rates and bronchi and increased serum leukocytes (Rhinehart, 2001). Possible infection was identified in home care client nursing charts documenting the following symptoms: redness around the surgical wound cite, swelling and tenderness around the wound cite and fever. Conversely, acquired infection was identified in home care client nursing charts documenting the following symptoms: purulent yellow/brown/green drainage, foul odour emitted from the wound and indication of infection documented in the nursing notes, as well as fever, redness, swelling and tenderness around the wound site.

Client nursing charts reviewed also included administrative data pertaining to client demographics, whether or not clients resided in seniors' housing or in their own home in the community, and their assessed support rating. Indicators of possible infection and acquired infection among post-acute home care clients were found in the wound care flow sheet included in each nursing chart and notes recorded by the providing nurse. Following each chart review, all data were transferred into SPSS 21 and codified to enable analysis.

2.5.2 *Statistical Analysis*

Descriptive data analysis was used to document client characteristics and demographics included in the study sample. The proportion of screening criteria identified was then reported. In order to report a

non-biased estimate of post-acute home care clients who displayed clinical signs and symptoms of possible infection and acquired infection, post-acute clients admitted to home care with infection were removed from the sample. The proportions of nursing charts with clinical signs and symptoms of possible infection and acquired infection post-admission were then reported.

Next, to determine the effect of client demographics, screening criteria, possible infection and acquired infection post-admission, on TCH using General Linear Modelling (GLM), the dependent variable TCH was evaluated to determine if it was suited to linear modelling. The results of this analysis suggested TCH was non-linear in nature; *skewness* = 2.45, *kurtosis* = 8.85. The Shapiro-Wilk test (1965) of normality also suggested TCH was not suited to linear modelling. Accordingly, TCH was Log transformed and retested to determine suitability for linear modelling. This analysis indicated a Log transformation of TCH normalised the dependent variable, Shapiro-Wilk = .976, $df = 94$, $p = .078$. Last, the screening criteria, as well as possible infection and acquired infection post-admission were evaluated using GLM to determine their effect on TCH received by post-acute home care clients with wound care.

2.6 Limitations

The limitations of this research should be acknowledged when evaluating and interpreting the results. This internally driven program evaluation employed a convenience sample of nurses willing to complete questionnaires and home care clients with unusual complexities were left out. Accordingly, the sampled population may not be representative of all post-acute home care clients and therefore the ability to generalise research findings are limited. The nature of post-acute home care service delivery is such that nurse providers frequently rely on team communication to provide care as they may only see post-acute clients home care clients more than once. Therefore, due to a lack of continuity of nurse provider care, it was not possible to evaluate post-acute home care nurse survey responses longitudinally. Additionally, lack of continuity of care may have contributed to an increased number of client visits that may not have been necessary otherwise (O'Brien-Pallas et al., 2001).

Although this research was a part of an internal program evaluation, home health aides did not

respond to post-acute home care questionnaires, while nurse providers, despite the care demands of delivering health services to clients with complex needs, participated in the research. Consequently, future research examining home care should strive to capture data from home health aids providing supportive care in the community. Weakness in the current home care data infrastructure affected the ability to: easily identify post-acute home care clients in the administrative data; define and track program principles objective and service goals; standardise reporting procedures; and capture data in real-time. Last examination of home care expenditure was impeded by incomplete financial data as home care in the Saskatchewan health region studied only collects costing data on insured services.

2.7 References

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Chapter 3

Article 1: Quality and performance assessment of post-acute home care services: patient and nurse provider perceptions of quality

3.1 *Relationship of Article 1 to Dissertation*

This research investigated post-acute home care in the health region studied to evaluate progress in achieving post-acute home care program service goals and improved client outcomes. The results were obtained by using surveys of post-acute home care clients and home care nurse providers. Surveys were designed to investigate perceptions of quality of care and program performance. Surveys of clients and nurse providers captured: care objectives and service outcomes; patient-centeredness; trust in providers; health improvement/decline; emotional/social functioning; functional status; injury avoidance and overall quality (Survey materials are found in the Study Instruments Appendices). The results highlight factors influencing client and nurse provider ratings of quality of services. This study responds to the scant research investigating quality of post-acute home care services and provides a greater understanding of factors contributing to quality of care and total care hours received by post-acute home care clients to help define improvements to services delivered. Investigating post-acute home care quality and performance is essential to: support the full integration of home care into primary health care; facilitate the receipt of timely and appropriate care; and developing and improving existing client assessment services. This paper was written for *Home Health Care Management & Practice*.

3.2 Abstract

Aggressive discharge policies from hospital send more patients recovering from acute illness to receive post-acute home care. In light of the increasing number of patients discharged early from hospital to home care this study examined post-acute home care services. The study sample consisted of 173 adult clients receiving home care services and 129 of their nurse providers. Surveys, for client and nurse providers, captured: care objectives and service outcomes; patient centeredness; trust in providers; health improvement/decline; emotional/social functioning; functional status; injury avoidance; and overall quality. For clients, perceptions of quality were significantly affected by patient centeredness and experiencing unexpected complications. For nurse providers, overall quality of care provided was significantly related to patient centeredness, service outcome, team communication and injury avoidance. Analyses revealed that for clients with complex needs, the service period could be extended from 60 to 97 days which would cover 50.0% of clients.

Key Words: quality of care, patient centered care, performance assessment, post-acute home care, program evaluation, survey methodology.

3.3 Introduction

As hospitals in Canada continue the trend of discharging patients earlier, expenditure on home care has increased incrementally (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008). Three factors have influenced funding allocated to home care. First, Canadian hospitals in the 1990s adopted more aggressive discharge planning and shorter stays for patients, to attain public sector cost-savings (Coyte & McKeever, 2001; First Ministers of Canada, 2003; Premiers Council of Canada, 2002; Woodward, Abelson, Tedford, Hutchison & 2004). This policy decision has led to an influx of patients recovering from surgery and/or acute illness accessing home care services.

Second, there has been increasing focus on quality improvement and performance measurement initiatives to ensure that adequate value is received for the money and effort invested in healthcare (Auditor General of Canada, 2002; Canadian Home Care Association, 2004; Flood & Choudhry, 2002; Johnston, 2004). Over the last 30 years the cost of health care has almost doubled for industrialised nations; and greater financial investment in health care does not always yield better results (Anderson, Reinhardt, Hussey & Petrosyan, 2003; Organization for Economic Cooperation and Development, 2004; Retzlaff-Roberts, Chang, Rubin & 2004). Third, increased focus on quality assessment in home care is also a by-product of utilising staff with varying degrees of training. The utilisation of staff with varying degrees of training may negatively impact the ability to provide sufficient care to clients with complex needs and varying functional abilities.

There is a paucity of research comparing the quality of supportive and preventive home care with similar health services in hospitals. Available research suggests supportive and preventive home care does not necessarily increase client independence or contribute to increased life expectancy (Kirby & LeBreton, 2001). The systematic evaluation of home care services in Saskatchewan conducted by the Health Services Utilization and Research Commission (HSURC) in 2000 found seniors housing to be more cost effective at keeping seniors alive and out of nursing homes than preventive home care. (Health Services Utilization and Research Commission, 2000b).

To confirm whether or not early discharge of patients from hospital contributes to public sector

cost savings there is a need to identify home care client outcomes and to track and record insured and uninsured costs (First Ministers of Canada, 2003; Sanober, Motiwala, Colleen, Flood, Peter, Coyte & Laporte, 2005). Home Care services must be reconceptualised to focus on achieving client-centred outcomes of care (Thompson, 2000). As a result, when evaluating short-term acute home care services the care goal should be curative, thus the expected outcome is restoration of functioning that has been temporarily lost or to limit the loss of functioning caused by an acute event or illness (Thompson, 2002). When evaluating quality in health care it is also important to examine the dimensions of health care performance that can be defined, are measurable, and where measures are practical and relevant to the purpose of maintaining, restoring or improving health (Kelly & Hurst, 2006).

The Institute of Medicine has identified the following six dimensions through which quality is expressed: safety, effectiveness, patient centeredness, timeliness, efficiency, and equity (Institute of Medicine, 2001). Accordingly, assessment of quality in health is the process of making a judgment on the goodness of healthcare, based on one or more of the following: the expected or realized ability of the care to achieve the greatest improvements that the current science and technology in healthcare can achieve; acceptability to patients (including families); and acceptability to the community (or society at large) (Donabedian, 2005). Consequently, when evaluating quality of care it is important to develop a greater understanding of patient perceptions of health care quality and identify how they differ from the perceptions of clinicians.

Examination of available research on patient satisfaction and patient centered care reveals that many of the concepts are grounded in the perspective of clinicians, researchers or administrators (Sofaer & Firminger, 2005). For patients, quality health care is: having physical and emotional needs met; receiving individualised care; involvement in care and inclusion in decision making; health care teams and staff that have personalised knowledge, who respect and are aware of the patients' health beliefs and attitudes about alternative health practices, who build rapport, are respectful, listen and anticipate care needs; protect patient confidentiality and privacy; nurses who act as patient advocates; involving family and friends when appropriate; and equality of care (Infante et al., 2004; Larrabee & Bolden, 2001; Ngo-

Metzger et al., 2003).

Lynn and McMillen in 1999 found that nurses overestimate the importance of trust, empathy, competence, patient examinations and explanations of health status to the patient. In contrast, patients were found to give greater importance to having: a skillful nurse, available equipment and supplies needed for patient care and access to nurses when needed. In 1996 Laine, et al. found that patients and physicians agree on the importance of clinical skill, but identified disagreement between patients and physicians on the importance of sharing information; with patients placing greater importance on sharing information than physicians. Jung, Wensing, Olesen, and Grol (2002) on the other hand, found clinicians to be more critical of care provided than their patients and that clinicians overestimated their performance on wait times and communication.

Emphasis on providing care at home and in the community rather than in hospital makes evaluation of quality difficult due to: the independent nature of home care service delivery; increasing complexity of home care services; and a lack of readily accessible physician and institutional support (Canadian Home Care Association, 2013; Fireman, Bartlett, & Selby, 2004; Leatherman & Sutherland, 2004).

At this time home care in Saskatchewan is faced with both opportunities and challenges. The five year strategic priority of the healthcare system in Saskatchewan is to achieve "*Better Health, Better Value, Better Care, Better Teams*" through the improvement of connectivity in primary health care sites, an emphasis on safety and improved access and patient flow (Canadian Home Care Association, 2013; Regina Qu'Appelle Health Region, 2013). The patient experience will also be addressed through "*Sooner, Safer, Smarter Surgical Care*" by improving continuity of care and access to specialists (Government of Saskatchewan, 2014).

Safer surgical care has been addressed through the implementation of surgical safety checklists, surgical site infection prevention protocols, identification of factors that can cause falls and examination of the root cause of errors before they cause harm (Government of Saskatchewan, 2014). The health regions in Saskatchewan have also developed patient pathways to streamline care processes and ensure

patients receive care that is timely and appropriate by creating shared decision making tools to support patients in making treatment decisions. Also health regions in Saskatchewan have adopted Lean Management Systems to support continuous improvement that looks to identify waste, eliminate activities that do not add value and encourage regular team meetings to enable staff to solve problems in real -time (Government of Saskatchewan, 2014).

The current strategic emphasis in Saskatchewan developed by the Ministry of Health to address lengthy surgical wait times and to increase surgical capacity in the province also makes the evaluation of post-acute home care provided in Saskatchewan a timely priority (Saskatchewan Ministry of Health, 2010). As such, the post-acute Direct Services Home Care program in the health region studied is designed to support the Saskatchewan Surgical Initiative through the development of stronger primary health care teams by expanding services to support seniors at home and in the community; and the treatment of post-surgical clients discharged early from hospital. Specifically, its objectives are to "provide the capacity for early hospital discharge, to prevent re-admission and to avoid imminent admission" (Saskatchewan Ministry of Health, 2010).

In order to support the Saskatchewan Surgical Initiative there is a need for greater understanding of the efficiency and effectiveness of the current post-acute home care program. However, the ability to evaluate the existing program is limited because: costing data is only collected on uninsured services; post-acute clients are not easily identified in the administrative data; defining care outcomes is difficult; reporting of client health data in the nursing charts is not standardised; nursing charts do not consistently convey client status or care needs; steps taken to resolve problematic aspects of care are not recorded; and the post-acute Direct Services Home Care program has not developed structured surveys or other methods to capture quality of care.

Evaluation of the existing post-acute Direct Services Home Care program is also limited by the fact that nurse providers cannot be easily monitored by managers and nurse educators as they provide care in the community, and lack institutional support to address increasing complexity of home care client conditions and service needs (Auditor General of Canada, 2002; Canadian Home Care Association,

2013). In addition, home care in Saskatchewan has not fully implemented the client groupings developed by the Canadian Institute for Health Information (CIHI) Development of National Indicators and Reports of Home Care Project (2004) to enable comparisons between jurisdictions and categorize clients (i.e. Maintenance, Rehabilitation, Long-Term Supportive Care, Acute Care Substitution and End-Of-Life Care). Thus, comparisons between jurisdictions and across provinces are not possible due to different regulations, guidelines and goals under which they operate (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008).

In light of the operational program limitations in the home care program, formative rather than summative, evaluation methodology was used in this research as it serves to foster real-time adaptations and refinements to improve the effectiveness of patient-centred care (Agency for Healthcare Research and Quality, 2013; Center for Disease Control, *n.d.*; McDavid, Huse, & Hawthorn, 2013). A summative approach, which involves making judgements about the efficacy of a program at its conclusion, was not conducted as the post-acute Direct Services Home Care program is ongoing (Agency for Healthcare Research and Quality, 2013; McDavid, Huse, & Hawthorn, 2013). Also, a summative approach was not appropriate due to existing limitations in the available data, particularly administrative and costing information. Therefore, the focus of the research became to: 1) assess the extent to which post-acute home care is meeting its program principles, objectives and service goals; 2) determine client factors contributing to length of care; 3) compare client and nurse provider ratings of the quality of post-acute home care; and 4) identify factors contributing to client and nurse provider ratings of post-acute home care quality (Yarbrough, Shulha, Hopson, and Caruthers, 2011).

The Saskatchewan Home Care Policy Manual states the goal of home care is to provide health care to "people who need acute, end-of-life, rehabilitation, maintenance and long-term care to remain independent at home" while "encouraging and supporting assistance provided by the family and/or community" (Saskatchewan Ministry of Health, 2010, pp1). As such, the post-acute Direct Services Home Care Program principles, objectives and service goals are to help home care clients maintain independence and well-being at home and in the community through avoidance of untoward events,

identification of hazards in the home, and support in developing a safety plan Saskatchewan Ministry of Health, 2010). A secondary goal of the post-acute Direct Services Home Care Program is to facilitate appropriate use of health and community services through eliminating unnecessary hospitalisation and need for contact with health service providers outside of home care (Saskatchewan Ministry of Health, 2010).

To foster real-time adaptations and refinements in the post-acute Direct Services Home Care program (Appendix A) and determine the degree to which program principles, objectives and service goals are met, this research used survey data from home care clients and their nurse providers collected at three points in time to evaluate services provided and examine perceptions of quality.

3.4 Methodology

3.4.1 *Sample*

The study sample was drawn from adult clients with normal cognitive abilities newly admitted to the post-acute Direct Services Home Care program and their nurse providers in the health region studied. Post-acute home care clients included all clients noncomplex in nature who have the expectation to return to a normalised state, given the diagnosis and overall situation. Direct Services clients must meet the criteria to receive the allotted 60 days of service with the exception of some nursing services that may require longer duration of care. Examples of nursing referrals that may qualify for this exception include: Home Infusion Therapy Program clients who require antibiotic therapy; routine urinary catheter changes; and medication injections.

Home Care nursing staff is comprised of both Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) who are licensed to practice in Saskatchewan (Saskatchewan Ministry of Health, 2010). Home care nurses carry out a variety of interventions and procedures in many different settings. To ensure patient safety, nurses are not required to perform any procedure they do not feel competent providing. In addition, once the professional nurse is fully aware of the client assessment, the nurse will identity the client care needs and determine appropriate nursing interventions in conjunction with

available physician orders regarding client care.

3.4.2 *Survey development*

Given there is currently no available survey developed to measure the post-acute Direct Services Home Care program principles, objectives and service goals identified in the Saskatchewan 2006 Home Care Policy Manual from the perspectives of both post-acute clients and their nurse providers. Two similar survey instruments (one for the post-acute home care client and the other for their nurse provider) were examined to assist in the development of items: the Home Health Care CHAPS Survey (Agency for Healthcare Research and Quality, 2013) and the Next Steps in Care Home Health Agency Performance Self-Assessment Survey (United Hospital Fund, 2009). Following the examination of these surveys, items were developed in collaboration with the Home Care Director and Operations Manager in the health region studied. A two page survey was developed in consultation with the Nursing Manager of Operations and the Director of Home Care in the Saskatchewan health region studied. Survey items were developed to investigate the degree to which home care is achieving the mandate of providing quality care while keeping clients safe and independent in the community. Instruments were reviewed at six incremental development stages by the Nursing Operations Manager and senior nursing staff.

Items were designed to capture client functional status and the following dimensions of quality: safety, effectiveness, patient centeredness, and timeliness. Scale metrics were designed using commonly understood adjectives conveying degrees of satisfaction, completion, safety and quality (Aday, 1996). Because people often disagreed on the severity of slightly and partially both adjectives were used in a seven point scale and in subsequent analysis recoded to five points (McDowell, 2006). Client surveys were developed to collect data on the following aspects of care: Post-acute Home Care objectives and service outcomes; patient centeredness; trust in provider ability to deliver necessary care, service interruption; health improvement/decline; functional status; social/emotional status; and injury avoidance, using a Likert-Type response format. Instruments were reviewed at six incremental development stages by the Nursing Operations Manager and senior nursing staff.

Client perceptions of the overall quality of post-acute home care were captured using a 100 point scale ranging from 0 (i.e., not at all) to 100 (i.e., perfect). Similarly, surveys administered to home care nurse providers were also two pages. Post-acute home care nurse provider surveys were developed to collect data on the following aspects of care: care outcomes; post-acute home care objectives; patient centeredness; team communication, service interruption; health improvement/decline; client functional status; client social/emotional status; and injury avoidance, using a Likert-Type response format. Scale metrics were designed using commonly understood adjectives conveying degrees of satisfaction, completion, safety and quality (Aday, 1996). Because people often disagreed on the severity of slightly and partially both adjectives were used in a seven point scale and in subsequent analysis recoded to five points (McDowell, 2006). Nurse perceptions of the overall quality of post-acute home care provided to their clients were also captured using a 100 point scale ranging from 0 (i.e., not at all) to 100 (i.e., perfect) as per Lepnurm et al., 2012 (Table 3.1).

Table 3.1 Latent constructs of Home Care client and nurse surveys

Client survey	Nurse survey
Care outcomes *Did you have unexpected symptoms/health complications while receiving home care?* *Were you hospitalised while receiving home care?* *Have you contacted health care providers outside of home care?*	**Care outcomes** *Did you have unexpected symptoms/ health complications while receiving home care?* *Was the client hospitalised while receiving home care?* *The client's needs were met by the services provided by home care.*
Falls prevention *Home care staff identified hazards in my home*	**Falls prevention** *Did you identify hazards in the client's home?*
Patient safety *Do you have a safety plan?*	**Patient safety** *Does the client have a safety plan?*
Patient-centeredness *Home care staff took the time to actually find out how I was feeling.* *Home care staff discussed and explained the care provided to me.* *The services provided by home care meet my care needs.* *I felt comfortable discussing my health concerns with home care staff.* *I trust home care staff who visit my home.*	**Patient-centeredness** *I was able to take the time to listen to the client's concerns regarding care.* *I was able to take the time to assess all of the clients' symptoms.* *I was able to take the time to discuss and explain/teach the treatment process and care plan with the client.* *I have developed a trusting relationship with the client.*
Procedural elements of care *All the necessary home care supplies were available to your care provider.* *Home care interrupted my services.*	**Procedural elements of care** *Were physician orders available when necessary?* *All the necessary client information to provide care was available.* *I was able to obtain all the necessary home care supplies to provide care to this client.* *Provision of home care to this client has been interrupted.*
	Team work *There has been sufficient communication between home care team members to provide care to the client.* *In order to meet the client's needs home care providers worked together as a team.*
Health status improvement/decline *How would you rate your overall health status?*	**Health status improvement/decline** *How would you assess the client's overall health status?*
Functional Status *I am able to maintain my home on my own (i.e. do laundry & cleaning).* *I am able to prepare or obtain my own meals.* *I am able to pay my bills.* *I am able to perform personal care activities on my own (i.e. washing & toileting).*	**Functional Status** *The client is able to maintain their home independency?* *To what degree is the client able to prepare or obtain their own meals?* *Is the client is able to pay their own bills? (please skip if you don't know)* *To what degree is the client able to perform personal care activities independently?*
Social/emotional status *I am able to see relatives when I want to* *I am able to see friends and acquaintances when I want to.* *I am satisfied with my current living situation.*	**Social/emotional status** *The client is able to see their family and relatives when they want to.* *The client is able to see their friends and acquaintances when they want to* *In your opinion is the client depressed?*
Injury Avoidance *I am able to avoid injury and falls when home alone.* *I am able to avoid injury and falls when out and about.*	**Injury Avoidance** *The client is able to avoid injury and falls when home alone.* *The client is able to avoid injury and falls when out and about.*
Overall quality of home care *Having considered the care that has been provided to you by home care, please give me your assessment of the OVERALL QUALITY of home care on a 100 point scale.*	**Overall quality of home care** *Having considered the care that has been provided to the client, please indicate your assessment of the OVERALL QUALITY of home care provided using the following standards.*

3.4.3 *Procedures*

A longitudinal prospective cohort research design that spanned over eight months was used to

evaluate the quality of post-acute home care services in the health region studied. Data were collected from clients and nurses at three different time points: the first week of care, the approximate mid-point of care, and the last week of care using similar survey tools developed for each time point. However, because home care service delivery does not permit continuity of nurse provider care the nursing data were analysed cross-sectionally. Home care clients were introduced to this research through home care scheduling staff while arranging required care visits. At this time home care staff informed potential participants that home care in the health region studied is currently evaluating the performance and quality of its post-acute program to assess the quality of care and to identify care outcomes. Potential participants were also informed they may be contacted by phone and asked to participate in this research. A single evaluator collected client survey data by telephone using a standardised script during regular business hours. In the case where a client wished to participate but was not physically able, a proxy respondent (i.e., spouse, primary caregiver, or family member) was used.

Home Care nurses in the health region studied were introduced to this research through attending one of six brief information sessions, presented by the evaluator and the Home Care Director, held at the beginning and end of the workday. The purpose of these information sessions was to introduce the research to home care nurses and allow for questions and concerns to be addressed by the researcher and participating home care senior management. All nurse survey materials were distributed to full-time and permanent part-time home care staff via the individual client chart/information created for each client upon admittance to the post-acute Direct Services Home Care program. Surveys distributed to nurses providing care to client participants also included an information sheet indicating the research has been approved by the Behavioural Research Ethics Board. The nurse information sheet discussed their rights as participants and indicated they can withdraw their responses up to the point when the client participant is discharged from care or when the study is completed. In addition, the information sheet indicated when possible, surveys were to be completed by the same nurse at each point in time; during the first week of care, the mid-point of care, and during the last week of care.

Surveys were readily administered with no difficulties. During data collection nurse providers

were continually engaged through: newsletters, information sessions and regular contact before shift and after shift. Participant anonymity was achieved by assigning home care clients and their attending nurses coded study numbers and having completed nurse surveys with no identifying information, returned in sealed envelopes with administrative paperwork. To ensure participant safety, if a home care client was identified to be at risk of injury/suicide or experienced an untoward event while receiving home care the evaluator immediately notified the home care managerial team using appropriate administrative channels.

3.4.4 *Statistical analysis*

Survey data collected from clients and their nurse providers were entered into Excel by a single evaluator at each of the three survey times. Following the study period, the dataset consisting of client and nurse provider responses was transferred into SPSS 21 statistical software package. Data were cleaned and frequency distributions were used to identify variables containing out of range values. As both patient and nurse surveys were developed using insights gleaned from the literature on quality assessment, patient perspectives of quality and senior leadership of home care. Exploratory Factor Analysis (EFA) was conducted to examine face and content validity, explore dimensions in the instruments, and to facilitate the creation of composite scores. After identifying dimensions in both client and nurse instruments, scale score reliabilities (i.e., Cronbach's alpha coefficients) for each dimension were evaluated and the mean and standard deviation of dimensions identified as having a Cronbach's alpha greater than .60 were reported. Test-retest reliability was evaluated over three points in time with Cronbach's alpha coefficients, a measure of internal consistency (Tabachnick & Fidell, 2007).

Next, to determine the degree to which post-acute home care services in the health region studied are meeting principles, objectives and service goals, frequency analysis was run on the client data to identify the proportion of clients who reported unexpected symptoms/health complications, were hospitalised, contacted health services outside of home care, indicated their providing nurse identified hazards in their home and that they had a safety plan. The degree to which the post-acute home care program is meeting its principles, objectives and service goals was also investigated though examining

home care client and nurse provider responses pertaining to unexpected complications/untoward events, hospitalisations, identification of hazards in the client home and a client established safety plan at each time point. Client wait time from admission to post-acute home care to first day of service was also examined using frequency analysis to determine the proportion of clients who received service within 48hrs of admission. In addition, the mean and standard deviation of post-acute home care service was examined to determine whether or not the existing program duration of 60 days or more for clients with complex nursing care is appropriate.

The proportion of post-acute home care client and nurse provider responses regarding unexpected symptoms/health complications, hospitalisation, identification of hazards, and client safety plans were then evaluated within each point in time to determine if they were significantly different. Next, client and nurse Injury Avoidance scale scores were also compared within each point in time to determine if they were significantly different. Repeated measures ANOVA was used to examine whether or not Client Functional Status and Injury to Avoidance ratings changed over time. Standard regression was then conducted using the post-acute home care client data to examine the effect of demographic variables on total days in care.

Last, factors contributing to client and nurse perceptions of post-acute home care quality were examined. Client data were analysed using General Linear Modeling (GLM) to account for repeated measures. Accordingly, four continuous predictor variables (i.e., Patient centeredness, Functional Status, Social/Emotional Status and Injury Avoidance scale scores) and two dichotomous predictor variables (i.e., Untoward Events/Health Complications and Hospitalisations) were employed; two of which, untoward events/health complications and Patient Centeredness, were retained. Nurse data, on the other hand were analysed using standard regression at each point in time. Five continuous predictor variables (i.e., Patient Centeredness, Communication, Service Outcomes, Client Functional Status and Injury Avoidance scale scores) were employed at each point in time.

3.5 Results

3.5.1 *Participants*

At baseline 173 home care clients admitted to the post-acute Direct Services Home Care program in the health region studied and 129 of their attending nurse providers participated in this formative program evaluation. Home care clients ages ranged from 19 to 95 ($\bar{x}$= 63.42; SD = 17.98). Table 3.2 provides sample descriptives for home care client respondent demographics at baseline.

Table 3.2 Percent distribution for client demographic data at baseline

		Percentage (%)
Gender		
	Male	38.7
	Female	61.3
Education		
	Some Elementary School	5.2
	Elementary School	4.69
	Some High School	17.3
	High School	30.1
	Post-secondary Training	13.3
	University	17.3
	Masters	2.9
	PhD	1.2
Marital Status		
	single	23.7
	married	54.3
	widowed	19.7
	separated/divorced	1.7
Living arrangement		
	lives alone	33.5
	with spouse only	42.2
	with spouse & other	9.8
	with spouse & others	10.4
	with caregiver family member	4
Total (n)		**173**

Home care nurses who participated in this research, on the other hand, were treated as cross-sections, as home care nurses work in a team environment and individual nurses may not treat the same home care client more than once, given the variation in their work schedule. Home care nurses' years in practice ranged from three to 45 years with a mean and standard deviation of 25.5 and 13.5 respectively. One hundred and twenty-nine home care nurses responded to the nursing survey at time one; 84 were Registered Nurses (RN), one was a Licensed Practical Nurse (LPN) and 44 chose not to respond. Seventy-five nurses responded to the nursing survey at time two; 39 indicated they were RNs, five indicated they were LPNs and 44 chose not to respond to the two page survey. Finally, 28 home care nurses responded to the nursing survey at time three; 13 indicated they were RNs, four indicated they were LPNs and 11 chose not to respond.

3.5.2 *Exploratory Factor Analysis*

As it was necessary to develop surveys to collect data from home care clients and their attending nurses, EFA was used to identify the latent constructs and to verify their reliability for use in this research.

3.5.2.1 *Client Survey:* Principle axis factor (PAF) analysis with oblique rotation was conducted on the first set of items as it was assumed that any resultant factors would be intercorrelated rather than orthogonal. Bartlett's test of sphericity was statistically significant and the KMO value (.672) suggested the data were suitable for factor analysis. The pattern matrix then was used to identify items that had minimum loadings of .6 and no cross-loadings greater than .3. Results indicated the following two items should be removed: "*I felt comfortable discussing my health concerns with home care staff*"; and "*Home care interrupted my services*". PAF analysis with oblique rotation was then rerun using the remaining items. The results suggested a two factor solution (eigenvalue 1 = 1.82 and eigenvalue 2 = 1.03), with the factors accounting for 36.4% and 20.5% of the variance, respectively. The scree plot also confirmed the presence of two factors. Reliability was conducted from each scale with items removed if their item-total correlations were $\leq .5$ and $\geq .7$ (the lower bound suggests adequate cohesion with the other items and the

upper bound prevents significant content overlap). Three items assessing home care client perspectives on patient centeredness and two items pertaining to their trust in provider ability to deliver necessary care were retained. Alpha coefficients for the Patient Centeredness and Trust in Provider Ability measures were .66 (95% *CI* = .565 - .742) and .11 (95% *CI* = -.204 - .341), respectively.

PAF analysis with oblique rotation was then conducted on the second set of items as it was assumed that any resultant factors would be intercorrelated. Bartlett's test of sphericity was statistically significant and the KMO value (.730) suggested the data were suitable for factor analysis. The pattern matrix then was used to identify items that had minimum loadings of .6 and no cross-loadings greater than .3. The results suggested a three factor solution (eigenvalue 1 = 2.8, eigenvalue 2 = 1.4 and eigenvalue 3 = 1.1), with the factors accounting for 32.4%, 16.0% and 12.7% of the variance, respectively. The scree plot also confirmed the presence of three factors. Reliability was conducted from each scale with items removed if their item-total correlations were ≤ .5 and ≥ .7 (the lower bound suggests adequate cohesion with the other items and the upper bound prevents significant content overlap). Four items assessed home care client perspectives on their functional status; three items assessed social/emotional status and two items pertained to injury avoidance. Alpha coefficients for the Functional Status, Social/Emotional Status and Injury Avoidance measures were .68 (95% *CI* = .587 - .748), .60 (95% *CI* = -.424 - .658) and .622 (95% *CI* = .487 - .722), respectively.

3.5.2.2 *RN Survey*: PAF analysis with oblique rotation was conducted on the first set of items administered to nurse providers, given it was assumed that any resultant factors would be intercorrelated rather than orthogonal. Bartlett's test of sphericity was statistically significant and the KMO value (.756) suggested the data were suitable for factor analysis. The pattern matrix was then used to identify items with minimum loadings of .6 and no cross-loadings greater than .3. Results indicated the following two items should be removed: "*I was able to obtain all the necessary home care supplies to provide care to this client*"; and "*Home care interrupted my services*". PAF analysis with oblique rotation was then rerun using the remaining items. The results suggested a three factor solution (eigenvalue 1 = 3.40, eigenvalue 2

= 1.54 and eigenvalue 3 = 1.03), with the factors accounting for 42.5%, 19.2% and 12.9% of the variance, respectively. The scree plot also confirmed the presence of three factors. Scale reliability was conducted on each measure with items removed if their item-total correlations were ≤ .5 and ≥ .7 (the lower bound suggests adequate cohesion with the other items and the upper bound prevents significant content overlap). Three items assessed home care nurse ratings of the degree to which the care they provided was patient centered; three items rated information and communication necessary to provide client care; and two items rated service outcomes (i.e. '*I have developed a trusting relationship with the client*' and '*The client's needs were met by the services provided by home care*'). Alpha coefficients for the Patient Centeredness, Information/Communication and Service Outcomes were .88 (95% *CI* = .839 - .912), .75 (95% *CI* = .66 - .81) and .64 (95% *CI* = .49 - .75) respectively.

PAF analysis with oblique rotation was then conducted on the second set of items administered to home care nurse providers. Bartlett's test of sphericity was statistically significant and the KMO value (.791) suggested the data were suitable for factor analysis. The pattern matrix was then used to identify items that had minimum loadings of .6 and no cross-loadings greater than .3. The results suggested a three factor solution (eigenvalue 1 = 4.83, eigenvalue 2 = 1.13 and eigenvalue 3 = .780), with the factors accounting for 60.3%, 14.1% and 9.8% of the variance, respectively. The scree plot also confirmed the presence of three factors. Scale score reliability was conducted on each measure with items removed if their item-total correlations were ≤ .5 and ≥ .7 (the lower bound suggests adequate cohesion with the other items and the upper bound prevents significant content overlap). Three items assessed home care nurse provider ratings of client functional status; three items assessed social/emotional status and two items assessed injury avoidance. Alpha coefficients for the Client Functional Status, Client Social/Emotional Status and Injury Avoidance measures were .92 (95% *CI* = .89 - .94), .39 (95% *CI* = .18 - .56) and .96 (95% *CI* = .94 - .97), respectively.

3.5.3 *Principles, objectives, and service goals*

Evaluation of home care client surveys indicated at time one: 18.8% of clients experienced

Unexpected Symptoms/Health Complications; 4% were hospitalised; 35.3% had contacted health services providers outside of home care; 2.3% indicated their providing nurse identified hazards in their home; and 2.9% indicated they had a safety plan. At time two: 19.1% of clients experienced unexpected symptoms/health complications; 9.5% were hospitalised; 54% had contacted health services providers outside of home care; 1.5% indicated their providing nurse identified hazards in their home; and 6.6% indicated they had a safety plan. At time three: 22.8% of clients experienced unexpected symptoms/health complications; 12.3% were hospitalised; 49.1% had contacted health service providers outside of home care; 1.8% indicated their providing nurse identified hazards in their home; and 8.8% indicated they had a safety plan.

Examination of home care nurse surveys at time one suggested: 94.6% reported physician orders were available; 12.4% of clients experienced unexpected symptoms/health complications; 3.9% of clients were hospitalised; 34.1% indicated they identified hazards in the clients' home; and 38.0% indicated they believed their client had a safety plan. At time two: 97.3% reported physician orders were available; 25.3% of clients experienced unexpected symptoms/health complications; 12% indicated their client was hospitalised; 37.3% indicated they identified hazards in the clients' home; and 49.7% indicated they believed their client had a safety plan. At time three, nurse surveys suggested: 100% reported physician orders were available; 25 % of clients experienced unexpected symptoms/health complications; 3.6% indicated their client was hospitalised; 21.4% indicated they identified hazards in the clients' home; and 53.6% indicated they believed their client had a safety plan.

Table 3.3 compares responses of home care clients with their nurse providers. In addition, Table 2.3 also reports the comparison of client and nurse proportions within each time point. The proportion of home care clients who reported experiencing unexpected symptoms/health complications, being hospitalised while receiving post-acute home care, having home care nurses identify hazards in their home, and having a safety plan was then compared with the responses of their nurse providers. The results of this comparison revealed nurse reports of identification of hazards in the clients' home were significantly higher than the proportion of their clients who reported identification of hazards in their

home by their nurse providers at time one and time two (Table 2.3). Nurse reports of the proportion of clients having a safety plan in place were also found to be significantly higher than their client responses at time one and time two (Table 3.3).

Table 3.3 Comparison of client and their nurse providers reported Home Care post-acute objectives, and service outcomes

	Time 1 (*n*=130)				Time (*n*=70)				Time 3 (*n*=18)			
	Client (%Y)	**Nurse (%Y)**	***Z***	***ρ***	**Client (%Y)**	**Nurse (%Y)**	***Z***	***ρ***	**Client (%Y)**	**Nurse (%Y)**	***z***	***ρ***
Unexpected health symptom/ complications	18.5	12.3	1.38	0.08	15.7	25.7	1.41	0.08	16.7	16.7	0	1.00
Hospitalised	4.6	3.8	0.03	0.37	8.6	12.9	0.78	0.22	5.6	5.6	0	1.00
Hazards identified	1.5	34.6	-7.36	<.001	2.9	35.7	-4.62	<.001	5.6	11.1	-0.58	0.28
Client safety plan	3.8	38.5	-6.31	<.001	8.6	45.7	-4.82	<.001	22.2	38.9	-1.08	0.14

Client Functional Status scale scores ranged from 4 to 28. At time one, the mean and standard deviation of client Functional Status scale scores was 23.93 (*SD* = 5.00). The mean and standard deviation of client Functional Status scale scores at time two was 25.82 (*SD* =3.60), while at time three it was 26.28 (*SD* =3.17). Repeated measures ANOVA of client Functional Status scores revealed client functional status improved over time, $F(1, 56) = 3771.45$, $p < .001$. Client Injury Avoidance scale scores, on the other hand, ranged from 2 to 14. At time one the mean and standard deviation of client Injury Avoidance scale scores was 12.80 (*SD* = 2.51). The mean and standard deviation of client Injury Avoidance scale scores at time two was 13.38 (*SD* =1.94), while at time three it was 13.80 (*SD* = .85). Repeated measures ANOVA of client Injury Avoidance scale scores were also found to improve over time, $F(1, 56) = 30240.21$, $p < .001$.

Nurse scores of post-acute client Functional Status ranged from 3 to 21. At time one, the mean and standard deviation of nurse scores of Client Functional Status was 15.22 (*SD* = 5.41). The mean and standard deviation of nurse scores of Client Functional Status at time two was 15.87 (*SD* = 5.21), while at time three it was 17.24 (*SD* =4.07). Nurse scores of post-acute client Injury Avoidance, on the other hand, ranged from 2 to 14. At time, one the mean and standard deviation of nurse scores of client In,jury Avoidance was 11.18 (*SD* = 3.18). The mean and standard deviation of nurse scores of client Injury Avoidance was 11.82 (*SD* = 2.39), while at time three it was 12.59 (*SD* = 2.21). As Injury Avoidance scale scores for clients and nurse providers had the same number of items and fell within the same range the scale scores were compared. The results of this comparison suggested: at time one, client scores were higher than nurse provider scores (t (258) =4.56, p<.001) and at time two, client scores were higher than nurse provider scores (t (138) =1.37, p =.001).

3.5.4 *Overall quality of care*

Examination of client and nurse provider ratings of overall care quality of post-acute home revealed at time one, on average, clients rated post-acute home care quality higher than their nurse providers (Table 3.4). At time two, post-acute home care clients rated home care quality higher than

their nurse providers' ratings of the overall quality of post-acute home care (Table 3.4). At time three, client ratings of post-acute home care quality were similar to their nurse providers (Table 3.4).

Table 3.4 Comparison of client and their nurse providers reported rating of overall quality of post-acute home care

	Time 1					Time					Time 3				
	Client	**Nurse**	***t***	***df***	***ρ***	**Client**	**Nurse**	***t***	***df***	***P***	**Client**	**Nurse**	***t***	***df***	***ρ***
Quality Ratings (0 – 100)	94	82.46	9.41	258	<.001	93.45	83.16	6.04	138	<.001	92.65	87.04	1.48	34	<.147
Total(n)		***130***					***70***					***18***			

3.5.5 *Client wait time: Hospital discharge to first day of post-acute home care*

According to the home care policy in the health region studied all clients are to receive care within the first 48hrs of admission. To determine the degree to which home care is achieving its policy goals, the proportion of client participants who received care within 48hrs of admission care was evaluated. The results of this analysis indicated: 22.0% of home care client participants received care the same day they were admitted to home care; 57.2% received care within 48hrs of admission to home care; 16.2% of home care client participants did not receive home care within 48hrs of admission; whereas, for 4.6% of home care client participants, data were not available indicating the length of time between discharge from hospital to first day of home care service.

3.5.6 *Post-acute Direct Services Home Care program duration of service*

The Direct Services definition indicates post-acute home care in the health region studied may be required for 60 days in duration or more for clients requiring complex nursing care, Mean days in care for post-acute home care clients were evaluated to determine whether or not the Direct Services Home Care program provides appropriate duration of service to meet their needs in the health region studied. The results of this analysis revealed post-acute home care clients days of service ranged from one to 256 days in care. On average, post-acute home care clients spent 96.92 (*SD* = 78.75) days in care with a median of 77 and a minimum of one day. Examination of days in service also suggested only 43% of the sampled clients received care service that lasted for the allotted 60 days, while 57% received more than 60 days of service.

3.5.7 *Factors influencing client perceptions of overall quality of care*

As the post-acute home care client data were obtained at three points in time, with observations nested within individuals, a GLM was developed. The results of this analysis indicated clustering at the individual level accounted for 26.3% of the total variance in quality of post-acute home care. Two covariates were found to have a statistically significant effect on perceptions of quality of post-acute home care: client rating of patient centeredness and experiencing an unexpected complication/symptom.

The Wald test indicated, together both covariates were jointly significant ($W = 55.50$, $p < .001$) and account for 83.03% of the total variation when predicting post-acute home care client ratings of overall quality of service. All other variables held constant; a one increment increase on the post-acute home care client Patient Centeredness scale is expected to increase client overall ratings by 3.6 points. Clients who experience unexpected health complications/symptoms overall quality ratings were 44.26 points lower ($\beta = -3.79$, $p = .003$) than the ratings of persons who did not experience unexpected health complications/symptoms. In addition, evaluation of model fit suggested good fit with the data and a statistically significant difference between the null and saturated model ($\chi^2 = 44.74$, $p < .001$).

3.5.8 *Factors influencing nurse perceptions of overall quality of care*

The results of the standard regression computed for home care nurse self-rating of overall quality of care provided to their post-acute home care clients at time one, revealed the predictor variables of nurse Patient Centeredness ($\beta = 1.052$, $p = .006$), Service Outcome scale scores ($\beta = 1.014$, $p < .007$) and Injury Avoidance scale scores ($\beta = 1.469$, $p < .001$) were found to be statistically significant ($R^2 = .321$, F (3, 125) = 19.261, $p < .001$). All other variables held constant, a one increment increase in home care nurse Patient Centeredness scale scores is related to a 2.86 increase in the overall quality score; a one increment increase in home care nurse Service Outcome scale scores is related to a 2.75 increase in the overall quality score; and a one increment increase in nurse ratings of their clients' ability to avoid injury when home alone or in the community is related to a 4.34 increase in the nurse overall quality score.

The results of the standard regression computed for home care nurse self-rating of overall quality of care provided to their post-acute home care clients at time 2 revealed nurse Patient Centeredness ($\beta = 1.356$, $p < .001$), Team Communication ($\beta = .924$, $p = .013$) and Injury Avoidance scales scores ($\beta = 1.281$, $p = .001$) were found to be statistically significant ($R^2 = .496$, F (3, 70) = 21.946, $p < .001$). All other variables held constant, a one increment increase in nurse provider Patient Centeredness scale scores was related to a 3.88 increase in the overall quality score; a one increment increase in nurses provider Team Communication scores was related to a 2.52 increase in the overall quality score; and a one increment

increase in nurse provider rating of their client ability to avoid injury when home alone or in the community was related to a 3.60 increase in the overall quality score.

Results of the standard regression computed for home care nurse provider self-rating of overall quality at time 3, on the other hand, revealed the predictor variable Injury Avoidance scale scores (β = 1.485, p =.009) was found to be statistically significant (R^2 = .244, F (1, 26) = 8.089, p = .009). All other variables held constant, a one increment increase in nurse provider ratings of their clients ability to avoid injury when home alone or in the community was related to a 4.41 increase in the overall quality score.

3.6 Discussion

This study investigated the post-acute Direct Service Home Care program in the health region studied to evaluate progress in achieving program service goals and client outcomes. Evaluation of the proportion of clients responding to surveys suggests there is room to improve post-acute home care services to address client re-hospitalisation, unexpected health symptoms/complications and to reduce contact with health care professionals outside of home care. Evaluation of nurse provider surveys also suggested home care would benefit from implementing methods for nurses to better track client re-hospitalisations. Additionally, the significant difference between client and nurse reports of identification of hazards in the client home and client established safety plans suggests nurses are not fully communicating with their clients. The results of this investigation also revealed that client functional status scores and injury avoidance scores increased over time. This finding suggests that post-acute home care services in the health region studied is meeting the goals of: keeping clients safe while at home and in the community; providing restorative care to help clients heal and regain lost functioning (Home care Policy Manual, 2006). Furthermore, examination of the duration of post-acute home care in the health region studied revealed the post-acute Direct Services Home Care program could be extended from 60 days of service or more for clients requiring complex nursing services to 97 days; which would be enough time to cover 50% of the sampled population.

Evaluation of client and nurse provider ratings of overall quality of post-acute home care revealed

that home care clients consistently rated the quality of care to be higher than nurse provider ratings of quality at all three points in time. This is understandable given client dependence on their providers for care (Lepnurm Dobson, Voigts, Lissel, & Stamler, 2012). Factors influencing client and nurse provider ratings of overall quality of post-acute home care also differed. Client ratings of overall quality are positively affected by receiving care they perceive to be patient centered; and that client ratings of overall quality are negatively influenced by experiencing unexpected symptoms/health complications. Nurse provider perspectives on quality, on the other hand, are influenced to varying degrees by patient centeredness, team communication, functional status and injury avoidance. The discrepancy between the reports of identified hazards in the home found between client and nurse providers suggests nurses perceive they are effectively communicating with their clients, while clients believe otherwise. The discrepancy found, also suggests there remains a need to foster, nurture and develop a culture of patient centered care, as discussed in the 2009 Patient First Review Commissioner's report to the Saskatchewan Minister of Health, by providing home care nurses with additional training directed towards improving their client communication skills (Dagnone, 2009).

The finding that 16.2% of post-acute home care clients did not receive care within 48 hours of admission suggests a pressing need to more accurately track patient flow and manage resources available to provide client care. In light of this, to facilitate the full integration of home care into primary health care so clients receive seamless, timely and appropriate post-acute home care there is a need to develop and establish accurate and functional ways to communicate with hospitals, regarding patients to be discharged early, still requiring post-acute care. Establishing a direct line of communication with hospitals about patients to be discharge early from acute hospitalisation will help home care services in the health region better anticipate client caseload and need.

The next step in facilitating seamless, timely and appropriate post-acute home care is to optimize available resources within home care to meet the needs of incoming clients. A starting point in understanding how to better manage available home care resources is the ability to more accurately track dispersion of nurse providers to client appointments in the community. Although this has been difficult,

as nurse providers work independently in the community with little to no supervision, new technology such as tablet computers with Global Positioning Systems and the use of cell phones to report aspects of the client visit that impact scheduling, can provide the much needed ability for home care to know the actual daily activities and location of nurse providers in the community. A better understanding of the location and daily activities of nurse providers will allow for home care management to more accurately develop client care schedules, as well as facilitate resource available to provide care to post-acute clients. Improved management of available resources will also help to meet the goal of providing care to post-acute clients within 48 hours of discharge from hospital; thus eliminating care delays that may occur during transition from hospital to the community. These activities will serve to increase the quality of patient centred care by more effectively meeting the care needs of post-acute clients.

Finally, it is important to address lack of available data and research regarding the evaluation and improvement of home care in Canada. Future research endeavours must seek to expand on existing research findings through continued evaluation of home care programs in Saskatchewan and the rest of Canada and the development of indicators of re-hospitalisation for post-acute home care clients. To encourage the evolution of home care services and facilitate the full integration of home care into the mix of primary healthcare it is desirable to increase the involvement of family physicians and other community based programs to support post-acute care clients discharged early from hospital to home care (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; Premiers Council of Canada, 2002; Woodward, Abelson, Tedford, Hutchison & 2004; First Ministers of Canada, 2003). To demonstrate integration of home care in the mix of primary healthcare it would be beneficial to expand the measures developed in this research or to identify and obtain access to standardised measures applicable to individual home care programs. However, utilisation of standardised measures requires the objectives, goals and services of provincial home care programs to be compatible. Compatibility of provincial home care program objectives, goals and services offers the potential for new synergies that will lead to improvements in these programs.

3.7 Conclusion

At this time, home care is experiencing an influx of post-acute clients discharged early from hospital to recover in the community. Given this reality, it is vital home care services develop methods to facilitate the smooth transition of patients referred from hospital to home care to ensure the care needs of post-acute clients are met and to eliminate delays in care. From an evaluative standpoint, the post-acute Direct Services Home Care program in the Saskatchewan health region studied is only moderately effective at meeting its principles, objectives and service goals. Specifically, client and nurse provider reports of established safety plans and identification of hazards in the home were not congruent; over half of post-acute home care clients exceeded the allotted days in care; many clients did not receive care within 48 hours of discharge from hospital and data indicating the length of time between discharge from hospital to first day of home care service was not available for some post-acute home care clients.

Differences in the report of established safety plans and identification of hazards in the home and in perceptions of quality between post-acute home care clients and their nurse providers, suggest increased effort to improve communication and involve home care clients in the development of care plans is needed. This research also suggests it is essential to better understand the daily activities of nurse providers and the factors associated with delays in care. Finally, to improve post-acute home care services it is important to continuously track program objectives, principles and service goals of post-acute home care delivered in the Saskatchewan health region studied. Adjusting the post-acute Direct Services Home Care program to address these challenges will contribute to the improvement of existing client assessment services and quality of care, as well as support the full integration of home care into the mix of primary health care.

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Chapter 4

Article 2: The effect of referral source, socio-demographic variables and comorbidities on total hours of care received by post-acute home care clients

4.1 *Relationship of Article 2 to Dissertation*

Using administrative data, this study investigated the effect of referral source, socio-demographic variables and comorbidities on total hours of care received by post-acute home care clients. Investigating factors influencing continuity of care and total hours of care received by post-acute home care clients is essential to: allocate resources; facilitate the receipt of timely and appropriate care; develop and improve existing client assessment services; and support the full integration of home care into primary health care. This study responds to the scant research investigating total hours of care received by post-acute home care clients using administrative data. Implementing the recommendations presented in this article should improve the quality of home care administrative data in the Saskatoon Health Region. This paper was written using the sixth edition of the APA style guide (2009) to meet the guidelines of the *Canadian Journal of Nursing Leadership*.

4.2 Abstract

Since the 1990s, home care programs have emphasized services to patients recovering from acute illnesses through the provision of post-acute home care. The study sample consisted of adult clients admitted to the Direct Services Home Care program in the Saskatchewan health region studied. Total Care Hours (TCH) was Log transformed for General Linear Modelling. The results showed that post-acute home care clients referred from emergency departments received approximately 84.2 % more TCH; post-acute home care clients referred from surgical wards received approximately 42.1% more TCH; and post-acute home care clients referred from cardiology received approximately 66.3% more TCH than clients referred from the community. Single clients received more TCH than married clients. The results suggested post-acute home care clients saw a median number of 12 nurse providers, indicating a need to develop strategies to improve continuity of care. When allocating post-acute home care resources the effect of referral source, socio-demographic variables and comorbidities on TCH need to be considered.

Key Words: quality of care, administrative data, post-acute home care, program evaluation, continuity of care

4.3 Introduction

Over the last 30 years expenditures on health care have increased for industrialised nations; and increasing investment in health care has not always yielded better results (Organization for Economic Cooperation and Development, 2004). Consequently, there has been increasing focus on quality improvement and performance measurement initiatives to ensure that adequate value is received for the money and effort invested in healthcare (Auditor General of Canada, 2002; Fireman, Bartlett, Selby & 2004; Johnston, 2004). At the same time, the policy of discharging patients recovering from acute illnesses early from hospitals in Canada in the 1990's, to achieve cost savings, has also led to an influx of patients accessing home care services (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; First Ministers of Canada, 2003; Premiers Council of Canada, 2002; Woodward, Abelson, Tedford, Hutchison & 2004).

At the present time, Home Care in Saskatchewan is evolving to better meet the needs of post-acute home care clients (Government of Saskatchewan, 2014; Regina Qu'Appelle Health Region, 2013). The post-acute Direct Services Home Care program in the Saskatoon Health Region supports the Saskatchewan Surgical Initiative in its objective to "provide the capacity for early hospital discharge, to prevent re-admission and to avoid imminent admission" (Saskatchewan Ministry of Health, 2010). The Direct Services Home Care program will contribute to the Saskatchewan Surgical Initiative through the development of stronger primary health care teams by: expanding services to support seniors at home and in the community and by treatment of post-acute clients discharged early from hospital.

There is scant Canadian research examining the factors influencing Total Care Hours (TCH) received by post-acute home care clients. The available research suggests clinical factors and environmental complexity predict variation in visit time and total number of visits, with medical nursing diagnosis explaining some of the variation in visit length (O'Brien-Pallas et al., 2001). O'Brien-Pallas et al. (2001) also found visits performed by degree prepared nurses contributed to fewer total visits received by home care clients and that continuity of care reduced total number of home care visits.

In light of the challenges facing home care in Saskatchewan, the paucity of Canadian research

evaluating home care nursing services using administrative data and the need for a deeper understanding of factors contributing to TCH received by post-acute home care clients, the goals of the present research are to: 1) identify post-acute home care client nursing services according to referral source; 2) test differences in total hours of post-acute home care according to referral source; 3) investigate client socio-demographic variables associated with total hours of care for clients referred from surgical wards and the community to home care; and 4) determine which comorbidities are associated with total hours of care received by post-acute clients referred to home care from surgical wards and the community.

4.4 Methods

4.4.1 *Home care nurse administrative data*

This research used post-acute home care administrative data collected in the Saskatoon Health Region. The administrative data used in this research was captured longitudinally at each point of contact and included the following data fields: gender, visit date, visit duration, nursing service codes, income category, type of admission, level of care, type of care, hospital discharge, subsidy requested, type of housing, place of residence, support rating, diagnoses and discharge date. It should be noted administrative data quality presents concerns as it does not always adequately fit the needs of researchers (Iron & Manuel, 2007). Nevertheless, in healthcare, administrative data are routinely used for strategic planning, to investigate system driven questions and to improve health care programs.

4.4.2 *Sample*

The study sample consisted of adult clients admitted to the post-acute Direct Services Home Care program in the Saskatoon Health Region. Post-acute home care clients are defined as all clients, non-complex in nature, who have the expectation to return to a normalised state given their diagnosis and overall situation. These clients generally receive services for an allotted 60 days with the exception of some nursing services that may require longer duration of care, such as antibiotic therapy; routine urinary catheter changes; and medication injections.

4.4.3 *Procedures*

A retrospective longitudinal cohort research design was used to evaluate factors associated with length of post-acute home care. Home care clients were introduced to this research through home care scheduling staff while arranging required care visits. At this time, home care scheduling staff informed potential participants that home care in the health region is currently conducting an internally driven program evaluation through surveys of client participants at: three separate points in time; administrative data analysis; and nursing chart reviews. Potential participants were also informed they may be contacted and asked to participate in this research. Client data were collected by telephone using a standardised script by a single evaluator. In cases where a client wished to participate but was not physically able, a proxy respondent (i.e., spouse, primary caregiver, or family member) was used. The home care Community Client Information Analyst extracted the administrative data on all post-acute home clients consenting to participate in this research.

The home care nursing administrative data received by the single evaluator was stripped of all post-acute home care client identifying information. The administrative data received was unbalanced panel data; therefore, was collapsed to enable data analysis of comorbidities, demographics, social support, and TCH. This resulted in summary variables for: days in care; number of nurses seen by each client participant; number of nursing visits; types of nursing services received; type of care received and TCH. For safety, if a home care client was identified to be at risk of injury/suicide or experienced an untoward event during data collection, the evaluator notified the home care management team.

4.4.4 *Statistical Analyses*

Home care nurse administrative data were used to determine the effect of referral source, socio-demographic variables and comorbidities on TCH received by post-acute home care clients. Prior to analysis, frequency distributions were used to identify the percentage of missing data and to examine whether any variables contained out of range values. The results of these analyses identified 93.6% of post-acute home care clients did not have income category recorded and that 95.5% of the sample did not

request subsidised care. As such, these two variables were excluded from data analysis using General Linear Modelling (GLM). Examination of referral sources revealed four post-acute home care clients referred from Gynecological and Obstetrics wards, one post-acute home care client referred from Oncology and Hematology, Psychiatry, and Rehabilitation. Six post-acute home care clients were referred following outpatient treatment. Four were referred from General Medicine, eight from Maternity and 12 referred to home care from the category 'Other' (i.e., General Medicine, Psychiatric and Ophthalmological wards).

The means and standard deviations of continuous measures were then calculated and TCH, the dependent variable, was evaluated to determine whether it was suited to analysis using GLM. The results of this analysis suggested TCH was non-linear in nature; *skewness* = 2.735, *kurtosis* = 9.567. The Shapiro-Wilk test (1965) of normality also suggested TCH was not suited to linear modelling. Accordingly, TCH was Log transformed and retested to determine suitability for linear modelling. This analysis indicated a Log transformation of TCH normalised the dependent variable, Shapiro-Wilk = .990, $df = 157$, $p = .331$. General Linear Modelling was then conducted to test differences in TCH received by post-acute home care clients according to referral source and sociodemographic variables individually. When evaluating the effect of referral source on TCH due to sample size limitations comorbidities only evaluated in post-acute home care clients referred from the Community and Surgical wards.

4.5 Results

4.5.1 *Sample*

A single evaluator submitted a request for administrative data on 173 clients receiving post-acute home care in the in the health region studied. In response to this request, home care nursing administrative data on 163 post-acute clients was received. The data were examined to identify post-acute clients living in urban and rural/town settings. The results of this investigation revealed two clients lived in rural/town settings, which is not enough to form a viable sub-group for comparative analysis. Accordingly, the data were restricted to only include urban dwelling post-acute home care clients.

Participants with missing data on referral source (n = 2) and nursing visits (n = 2) were also removed from the final data set. Therefore, the final sample consisted of 157 clients. Frequency distributions were then used to identify the percentage of missing data and to examine whether any variables contained out of range values. The results of this analysis identified 93.6 per cent of post-acute home care clients did not provide income information; thus, this variable was not included in the analysis.

4.5.2 *Participants*

On average, post-acute home care clients in the final sample received 19.31 total hours of care (*SD* = 22.28). Examination of post-acute home care clients in the final sample suggested post-acute home care clients received a median number of 26 visits and saw a median number of 12 nurses (range 1 – 68) while receiving post-acute home care (Table 3.1). In addition, frequency analysis revealed the majority of post-acute home care clients in the final sample were discharged directly to home care, and received supportive care (Table 4.1).

Table 4.1: Percent distribution of sample characteristics (n = 157)

	Percentage (%)	***n***
Type of admission		
Regular (i.e. uninsured supportive home care)	24.8	39
Short-term Nursing (i.e. 14 days of insured supportive home care)	75.2	118
Type of care		
Palliative	2.5	4
Acute	33.8	53
Supportive	63.7	100
Hospital discharge		
No	32.5	51
Yes (directly to Home Care)	57.3	90
Yes (within prev 30 days)	10.2	16
Seniors housing		
No	86.6	136
Yes	13.4	21
Support rating		
No support	5.1	8
Stable: usually/always availability	36.9	58
Stable: limited availability	52.2	82
Unstable	5.7	9

Table 4.2 reports the percent distribution of demographic data for the post-acute home care clients included in the final sample. Post-acute home care clients ages ranged from 19 to 92 years of age

(*M*= 63 .44, *SD* = 18.04). Female post-acute home care clients in the sample ages ranged from 19 to 92 (*M* = 63.35, SD = 17.34), while the ages of male post-acute home care clients in the sample ranged from 20 to 90 years of age (*M* = 63.56, *SD* = 19.16).

Table 4.2 Percent distribution for client demographic data (*n* = 157)

		Percentage (%)	***n***
Age groups			
	< 35	9.6	15
	35-49	10.2	16
	50-64	24.2	38
	65-75 yrs. of age	27.4	43
	>75 yrs. of age	28.7	45
Gender			
	Male	40.8	64
	Female	59.2	93
Education			
	Some Elementary School	5.1	8
	Elementary School	5.1	8
	Some High School	18.5	29
	High School	30.6	48
	Post-secondary Training	11.5	18
	University	16.6	26
	Masters	3.2	5
	PhD	1.4	2
Marital status			
	single	25.5	40
	married	52.9	83
	Widowed/Separated/Divorced	21.02	33
Living arrangement			
	lives alone	33.8	53
	with spouse only	42.7	67
	with spouse & other	8.3	13
	with spouse & others	10.8	17
	with caregiver family member	4.5	7

4.5.3 *Post-acute home care service by referral source*

Table 3.3 reports the nursing services associated with each post-acute client referral source. Table 4.3 also reports the means and standard deviations of TCH associated with each post-acute client referral source.

Table 4.3 Post-acute home care services by referral source

Community (*n* = 56)	Emergency Department (*n* = 10)	Surgery (*n* = 44)	Orthopedics (*n* = 19)	Cardiology (*n* = 12)	Gynecology (*n* = 4)	Other (*n* = 12)
Client conference Diabetic Care Heart Failure Home IV Therapy Medication management administration Med Reconciliation Post-surgical care Wound Care Wound consultation Education General Nursing Teaching Client assessment Mobility assessment Documentation	Diabetic Care Home IV Therapy Medication management administration Post-surgical care Respite Pediatrics Wound Care Wound consultation Education General Nursing Teaching Counsel Foot Care Documentation	Clinical Practice Diabetic Care Heart Failure Home IV Therapy Medication management administration Med Reconciliation Palliative Care Post-surgical care Wound Care Wound consultation Education General Nursing Teaching Respite Adults Foot Care Documentation	Clinical Practice Diabetic Care Home IV Therapy Medication management administration Palliative Care Post-surgical care Wound Care Wound consultation Education General Nursing Teaching Mobility assessment Documentation	Clinical Practice Diabetic Care COPD care Heart Failure Home IV Therapy Medication management administration Med Reconciliation Palliative Care Post-surgical care Wound Care Wound consultation Education General Nursing Teaching Mobility assessment Documentation	Diabetic Care Medication management administration Palliative Care Post-surgical care Wound Care Education General Nursing Teaching Counsel	Diabetic Care Medication management administration Palliative Care PCH teach Post-surgical care Wound Care Education General Nursing Teaching Documentation
Total Care Hours						
Mean 15.37	38.73	21.68	11.12	29.13	11.31	20.24
SD 15.77	42.97	17.43	13.53	33.89	10.31	31.71

Examination of the mean and standard deviation of days in care by referral source revealed clients referred to home care from community settings, on average, spent 100.54 (SD = 83.01) days in care. Post-acute clients admitted to home care from the Emergency Department, on average, spent 122.70 (SD = 89.26) days in care. Clients referred to home care from Same-Day-Surgery wards, on average, spent 91.05 (SD = 70.27) days in care. Clients referred to home care from Orthopedic wards, on average, spent 62.32 (SD = 80.70) days in care. Clients referred to home care from Cardiology wards, on average, spent 130.42 (SD = 75.55) days in care. Clients referred to home care from Gynecology wards, on average, spent 102.50 (SD = 101.69) days in care. Post-acute clients referred to home care from other sources (i.e. General Medicine, Psychiatric and Ophthalmological wards), on average, spent 97.67 (SD = 69.22) days in care.

4.5.4 *Total Care Hours by post-acute home care referral source*

GLM revealed in comparison to post-acute clients referred to home care from the community, post-acute home care clients referred from Emergency Departments received approximately 86.9 % more TCH; post-acute clients referred from Surgical wards received approximately 44.8% more TCH; and post-acute home care clients referred from Cardiology received approximately 69.1% more TCH (Table 4.4).

Table 4.4 Total Care Hours: post-acute home care reference source (*n* = 157)

			95% Wald Confidence Interval		*Hypothesis Test*		
Reference source	*B*	*Std. Error*	*Lower*	*Upper*	*Wald Chi-Square*	*df*	*p*
Emergency	.869	.3471	.189	1.550	6.273	1	.012
Surgical	.448	.2037	.048	.847	4.831	1	.028
Orthopedics	-.355	.2684	-.881	.171	1.750	1	.186
Cardiology	.691	.3216	.060	1.321	4.612	1	.032

Reference category: Community
Dependant Variable: Ln of Total Care Hours

4.5.5 *Community vs. surgical wards: socio-demographic variables associated with Total Care Hours*

There were not enough post-acute home care clients referred from Emergency Departments (n = 10), Orthopedics (n = 19) and Cardiology (n =12) to provide statistical power to determine statistical significance among these sub-groups of post-acute home care clients. As such, the effect of age group, support rating, and demographic variables were evaluated for post-acute home care clients referred from community settings and Surgical wards. The results of these analyses suggested gender was not statistically related to TCH after controlling for referral source.

Examination of differences in TCH received by clients according to their age suggested no association with the dependent variable Log of TCH. Evaluation of individual demographic variables captured by Home Care nursing administrative data among post-acute clients referred from the community and surgical wards revealed marital status to be statistically associated with the Log of TCH after controlling for post-acute home care client referral source. Specifically, single post- acute home care clients received approximately 62.5% (β = .652, p = .008) more TCH than married post-acute home care clients. Persons widowed or divorced, on the other hand, were not statistically associated with the Log of TCH after controlling for differences in referral source. Similarly, the post-acute client demographic variables: living arrangement, education and assigned support rating also were not found to be statistically associated with the Log of TCH after controlling for home care referral source.

4.5.6 *Community vs. surgical wards: comorbidities associated with Total Care Hours*

Post-acute home care clients captured in the administrative data were found to have a median of two comorbidities. The most commonly reported client comorbidities in the final sample were cardiovascular disease (45.2%), cancer (35.0%), and diabetes (26.8 %). Table 4.5 reports the beta weights, standard error, confidence intervals and p-value of the comorbidities associated with the Log of TCH among post-acute home care clients after controlling for referral source.

Table 4.5 Comorbidities associated with Total Care Hours: Community vs. Surgical Wards (*n* = 100)

			95% Wald Confidence Interval		*Hypothesis Test*		
Covariates	*B*	*Std. Error*	*Lower*	*Upper*	*Wald Chi-Square*	*df*	*Sig.*
Community vs Surgery	.433	.1926	.055	.810	5.051	1	.025
Cancer	-.464	.1945	-.845	-.083	5.689	1	.017
Respiratory disease	.890	.3067	.289	1.491	8.414	1	.004

Dependent Variable: Log of Total Care Hours
Model: (Intercept), Community vs. Surgery, cancer, Respiratory disease

4.6 Discussion

The present investigation examined the effect of referral source, socio-demographic variables and comorbidities on total hours of care received by post-acute home care clients using nursing administrative data. Post-acute care clients referred from the community received fewer hours of care than clients referred from hospital patient care units or the emergency room, indicating that referral source may be a driving factor in determining the amount of care provided or admission priority. Similarly, married home care clients received fewer hours of care than clients living on their own.

Saskatchewan Home Care responded to the need for a common shared home care information system across the Regional Health Authorities through the implementation of standardised provincial Comprehensive Home Care using Procura; and by implementing the Resident Assessment Instrument – Home Care (InterRAI, 2014) for functional assessment of Long-Term Supportive Home Care clients (Canadian Home Care Association, 2013).

The full potential of the administrative data system has not been realized. Specifically, home care clients receiving post-acute home care are not readily identifiable in the data; all nursing visits are entered in the data as occurring at 12 am; and real-time event information and clinical charting have not been integrated. Improving the administrative data system will facilitate the ability to examine factors affecting TCH in the health region studied and may lead to improved resource allocation.

Home care nursing administrative data would benefit from the regular assessment of data quality. All generally-used data should be routinely and systematically evaluated, with the understanding that the

interpretation of data quality is user defined and depends on the purpose for which the data are collected (Iron & Manuel, 2007). When chart abstraction is not feasible, available administrative data collected should include health services data that can be linked, to aid in evaluating the validity of data collected. Moreover, the relevance of every data quality assessment should be clearly defined and explained prior to commencing assessment of data quality.

Of paramount importance to achieving client centered care is the need to shift away from collecting healthcare administrative data from a service based point of view, towards collecting data on individual home care clients (Scottish Government, 2010). A shift to collecting administrative data from a service based point of view to a client-centered perspective would also improve the evidence base and understanding of all aspects of community care, as well as the factors affecting TCH.

As post-acute home care clients saw a median number of 12 different nurse providers, having more visits by the same nurse, rather than a different nurse for each visit, would improve continuity of care. Better continuity of care for post-acute home care clients may help to reduce TCH received and encourage appropriate delivery of services (O'Brien-Pallas et al., 2001). Also, providing continuity of home care is associated with increased satisfaction and loyalty for both patients and staff (Fairhurst & May 2006; Roberge et al., 2001; Saultz and Albedaiwi 2004); increased willingness to accept medical advice and adherence to long-term preventive regimens (Brookhart et al., 2007); improved problem recognition and quality of management (Hjortdahl & Borchgrevink, 1991); and reductions in prescriptions, test, Emergency Department visits and hospital admissions (Mainous & Gill 1998; Sweeney & Gray 1995). Therefore, home care administration must prioritise continuity of care to reduce fragmentation of care provided to post-acute home care clients to improve quality of service delivery and reduce overall operating costs.

To understand the factors affecting TCH, home care in Saskatchewan would benefit from obtaining the necessary licencing to use the InterRAI Acute and Post-Acute Care system (InterRAI, 2014), developed to identify older and disabled persons discharged from acute hospitals to the home care program who may benefit from comprehensive specialist assessment. Adopting the InterRAI Acute and

Post-Acute Care system (InterRAI, 2014) would also help to tease out associations between age group, marital status and comorbidities and TCH among post-acute home care clients referred to home care from surgical wards and the community. Moreover, adding standardised measures of post-acute home care offers the potential to improve the efficacy and management of home care resources to achieve cost effectiveness and a better understanding of controllable variables influencing the length and number of home care visits (O'Brien-Pallas et al., 2001).

In order to understand the factors affecting TCH, the next step is to address the administrative data limitations revealed in this research and to implement the strategic recommendations discussed. In light of the limitations identified in the discussion, to confirm whether or not early discharge of patients from hospital and/or shorter length of stay contribute to public sector cost savings there is a need to track and record insured and uninsured costs, as well as identify home care client outcomes (First Ministers of Canada, 2003; Sanober, Motiwala, Colleen, Flood, Peter, Coyte & Laporte, 2005). These research activities will help to generate more meaningful information regarding the factors associated with increased TCH. In addition, future research on post-acute home care services could also investigate the interaction between nurse education and years of practice on TCH.

4.7 Conclusion

To improve post-acute home care in the Saskatchewan health region studied, effective strategies are needed to increase continuity of care; this will serve to reduce TCH received by post-acute home care clients, encourage appropriate delivery of services and enhance overall quality of care (O'Brien-Pallas et al., 2001). When allocating post-acute home care resources, the effect of referral source, socio-demographic variables and comorbidities on TCH need to be considered. Since the goal is to improve the quality of post-acute home care services in Saskatchewan, it is important to make nurses accountable to report client visit information captured in the administrative data in real -time at the point of contact. At the outset, to improve the quality of the administrative data captured, a data field within the current management system to identify post-acute home care clients upon admission and at discharge from the

Direct Services Home Care program should be developed. This would improve the utility of home care nursing administrative data. At present, the building blocks to improve administrative data in the Saskatchewan health region studied are available. Addressing the administrative data limitations, implementing the recommendations gleaned and promoting increased research efforts will create synergies leading to improved management of TCH for post-acute clients in Saskatchewan.

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Chapter 5

Article 3: Unexpected health symptoms, complications and infection among post-acute home care clients receiving wound care

5.1 *Relationship of Article 3 to Dissertation*

This study responds to the scant research investigating quality of home care services and provides a greater understanding of factors contributing to the improvement of home care services. An important quality improvement mechanism for post-acute home care clients is examining infection and adverse events using nursing charts. This study documented the proportion of post-acute home care clients receiving wound care with possible and acquired infection, using clinical signs and symptoms recorded in their nursing charts post-admission; determined the effect of unexpected health symptoms, as well as possible and acquired infection on Total Care Hours; and provided strategic recommendations. Interpretation of the study results highlight the need for consistent methods of charting patient data to effectively report client status and wound progression, as well as providing an indication of care needs and steps taken to resolve problematic aspects of care. This paper was written using the sixth edition of the APA style guide (2009) to meet the guidelines of the *Canadian Journal of Nursing Research*.

5.2 Abstract

An important quality improvement mechanism for home care clients is examining infection and adverse events using nursing charts. Thus study identified 94 post-acute home care clients receiving wound care with possible and acquired infection post-admission, using clinical signs and symptoms. Post-acute home care clients receiving wound care experiencing unexpected health symptoms were also identified using screening criteria adapted from the literature. The effect of unexpected health symptoms and infection on Total Care Hours was evaluated using General Linear Modelling. Almost a third (31.0%) of home care clients receiving wound care displayed clinical signs and symptoms of possible (11.3%) or acquired (19.7%) infection. Post-acute home care clients with wound care admitted to home care with an infection received 77.9% more Total Care Hours (TCH) than clients admits without an infection. Post-acute home care clients with wound care who experienced injury, trauma or harm while admitted to home care received 53.3% more TCH. Post-acute home care clients identified to have acquired an infection after being admitted to home care received 70.2% more TCH. Evaluation of the available data suggest to better understand the effect of infection and adverse events among post-acute home care client there is a need for electronic charting using tablets to increase consistency, accuracy and reliability. Nurse managers should be encouraged to periodically accompany nurses on client visits to identify need for rehospitalisation, referral to allied health services and changes in care plans to address unexpected health symptoms.

Key Words: post-acute home care, wound care, infection, nursing chart review, quality of care

5.3 Introduction

Patient safety is central to the provision of quality health care services (Canadian Patient Safety Dictionary, 2003). An increasing number of surgical patients receiving home care resulting from early discharge from hospital (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; Premiers Council of Canada, 2002; Jacobs, Hall, Coyte & McKeever, 2001, Woodward, Abelson, Tedford, Hutchison & 2004; First Ministers of Canada, 2003) makes the infection rates among Home Care clients receiving post-acute home care services an important patient safety issue.

Safety concerns have been well investigated in acute care hospital settings and to some degree in long term care, emergency departments and within primary care using chart reviews (Baker et al., 2004; Brennan et al., 2004; Davis, et al., 2002; Vincent, Neale, Woloshynowych, 2001). Few studies, however, have examined used nursing charts to examine home care client safety issues. To date, home care research looking at client safety has primarily focused on adverse drug events (Ellenbeker et al., 2004; Gray et al., 1999), inappropriate medication use (Fialová et al. 2005; Golden et al. 1999; Meredith et al., 2001) and provided limited focus on rehospitalisation (Madigan, Schott & Matthews, 2001); operational failures (Bruno & Ahrens, 2005) and various forms of harm (Sears, Baker, Barnsley, & Shortt, S., 2013; Blais, et al., 2014). This is due to the distinct nature of home care, which includes the provision of services in home and community settings encompassing: health promotion and teaching; health interventions; palliative and supportive care; rehabilitation, assistance with social adaption and integration; and support for family providing care to home care clients with acute and long term illness and conditions (Canadian Home Care Association, 2013; Blais, et al., 2014). Limited client safety data is also related to the fact that attempts to measure adverse events and infection rates in home care are in their nascent stages (Rhinehart, 2001).

Home care is designed to complement the efforts of clients to care for themselves with assistance from informal caregivers (Canadian Home Care Association, 2013). Consequently, home care lacks the jurisdiction and control of care provided in hospital settings (Hirdes, et al., 2004; Rhinehart, 2001). This is related to the independent nature of home care service delivery which relies on nurse providers and

family caregivers, while lacking readily accessible institutional support to address the increasing complexity of home care client conditions and service needs (Auditor General of Canada, 2002; Canadian Home Care Association, 2013; Canadian Home Care Human Resources Study, 2002; Fireman, Bartlett, & Selby, 2004; Johnston, 2004; Laporte, Coyte & Cruxford, 2002). The professional medical component of home care involves nursing and rehabilitative therapies which include the provision of wound care, post-operative care, physiotherapy and occupational therapy to clients with complex medical needs; while the social service components of home care include homemaking services and personal care (Canadian Home Care Association, 2013; Canadian Home Care Human Resources Study, 2002; Flood, &Choudhry, 2002).

Although there is scant information on the proportion of infection among post-acute home care clients, a few Canadian studies have examined the incidence of adverse events in home care. Specifically, Johnson (2004) reported Home Care clients in Winnipeg experienced an annual adverse event incidence rate of 5.5%; injuries resulting from falls accounted for almost half the annual incidence rate. Sears, Baker, Barnsley and Shortt (2013) in their study of adverse events experienced by home care clients in Ontario reported an adverse event incidence rate of 13.2%. Doran and colleagues, using the Resident Assessment Instrument – Home Care, reported an adverse event incidence rate of 13% among Ontario home care clients and identified injurious falls, injuries other than falls, medication related events, cancer diagnosis and receiving antidepressant medications were associated with hospitalisation and Emergency Department visits in the provinces of Nova Scotia, Ontario, British Columbia and the Winnipeg Regional Health Authority (Doran et al. 2009;Doran et al. 2013; Doran et al. 2013b). Similarly, Blais et al. (2014) investigating adverse events among home care clients in three Canadian provinces using chart reviews, reported an adverse event incidence rate of 4.2% in home care clients discharged within a 12 month period (after adjusting for clients who received less than 12 months of home care). Blais et al. (2014) research also revealed a 10.1% adverse event incidence rate per client year. However, despite increasing attention given to the incidence of adverse events among Canadian home care clients, the proportion and incidence of infection among post-acute home care clients discharged from acute hospitalisation requiring specialised nursing care has not been adequately examined.

Investigating the proportion and incidence of infection among post-acute home care clients is important as attempts to cap healthcare expenditures have led hospitals to discharge patients earlier, resulting in an influx of patients recovering from surgery and/or acute illness accessing home care services in Canada (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; First Ministers of Canada, 2003; Coyte & McKeever 2001; Premiers Council of Canada, 2002; Woodward, Abelson, Tedford, Hutchison & 2004). Examining the proportion and incidence of infection among home care clients receiving post-acute care is also important as development of infection may lead to prolonged care and increased financial burden on provincially run home care programs.

In light of the need to investigate infection among post-acute home care clients, the present research objectives are to: describe the sample population; document the proportion of post-acute home care clients identified to have possible infection or acquired infection post-admission using clinical signs and symptoms recorded in the nursing charts; determine the influence of screening criteria adapted from the literature on variation of Total Care Hours (TCH); determine the effect of possible infection and acquired infection post-admission on TCH received by post-acute home care clients receiving wound care; and provide strategic recommendations for improving client nursing charts within the Saskatchewan health region studied.

5.4 Methods

This study was a part of an internally driven program evaluation of the post-acute Direct Services Home Care Program in the Saskatchewan health region studied. Home care clients were introduced to this research by scheduling staff who provided information while arranging required care visits. Potential participants were informed that home care in the health region was conducting a study using client surveys at three separate points in time, using administrative data and nursing chart reviews and they may be asked to participate in this research. To obtain consent and conduct client interviews a single evaluator contacted post-acute home care clients by telephone using a standardised script. During the telephone interview home care clients indicated their willingness to participate or their decision to withdraw; in

cases where clients wished to participate but were physically unable, a proxy respondent (i.e., spouse, primary caregiver, or family member) was used.

5.4.1 Nursing chart review

Post-acute nursing charts reviewed were specific to those home care clients receiving wound care agreeing to participate in this research. Nursing charts were created and maintained by Home Care Managers, Client Patient Assessment Services staff, Client Care Coordinators and Home Care nurses. Charts reviewed did not include physician records or cross-sector health records. Nursing chart entries were recorded on a daily, weekly or monthly schedule according to the needs of each client participant. Selected nursing charts were examined in three separate stages. In the first stage of the chart review, all client participants receiving wound care were identified. In the second stage, each selected nursing chart was reviewed using screening criteria adapted from Sears, Baker, Barnsley and Shortt (2013) to identify unexpected health symptoms (Table 4.1). The third stage, to identify wound care clients with possible or acquired infection using clinical signs and symptoms, was conducted by a nurse educator with extensive experience in leadership and instructional roles.

Definitions and methods for the surveillance of nosocomial infection used in hospital settings cannot easily be applied to home care because they rely heavily on laboratory data (Rhinehart, 2001); while in home care, clinical diagnosis of infection is formed using observed information with reliance on physical signs and symptoms (Rhinehart, 2001). The nurse educator utilised her extensive experience and knowledge of nursing services to summarise and identify possible and acquired infection using clinical signs and symptoms found on wound care flow sheets and within the nursing charts. Theb clinical signs and symptoms used included: fever, new antibiotic order, purulent drainage from a wound, change in colour or odour of urine, change in consistency or colour of sputum, respiratory rates and bronchi and increased serum leukocytes (Rhinehart, 2001). Possible infection was identified in home care client nursing charts documenting the following symptoms: redness around the surgical wound cite, swelling and tenderness around the wound cite and fever. Conversely, acquired infection was identified in home

care client nursing charts documenting the following symptoms: purulent yellow/brown/green drainage, foul odour emitted from the wound and indication of infection documented in the nursing notes, as well as fever, redness, swelling and tenderness around the wound site.

Client nursing charts reviewed also included administrative data pertaining to client demographics, whether or not clients resided in seniors' housing or in their own home in the community, and their assessed support rating. Indicators of possible infection and acquired infection among post-acute home care clients were found in the wound care flow sheet included in each nursing chart and notes recorded by the providing nurse. Following each chart review, all data were transferred into SPSS 21 and codified to enable analysis.

5.4.2 Statistical Analysis

Descriptive data analysis was used to document client characteristics and demographics included in the study sample. The proportion of screening criteria identified was then reported. In order to report a non-biased estimate of post-acute home care clients who displayed clinical signs and symptoms of possible and acquired infection, post-acute clients admitted to home care with infection were removed from the sample. The proportions of nursing charts with clinical signs and symptoms of possible and acquired infection post-admission were then reported.

Next, to determine the effect of client demographics, screening criteria, possible infection and acquired infection post-admission, on TCH using General Linear Modelling (GLM), the dependent variable TCH was evaluated to determine if it was suited to linear modelling. The results of this analysis suggested TCH was non-linear in nature; *skewness* = 2.45, *kurtosis* = 8.85. The Shapiro-Wilk test (1965) of normality also suggested TCH was not suited to linear modelling. Accordingly, TCH was Log transformed and retested to determine suitability for linear modelling. This analysis indicated a Log transformation of TCH normalised the dependent variable, Shapiro-Wilk = .976, $df = 94$, $p = .078$. Last, the screening criteria, as well as possible and acquired infection post-admission were evaluated individually using GLM to determine their effect on TCH received by post-acute home care clients with

wound care.

5.5 Results

5.5.1 Sample

A single evaluator retrospectively examined 173 post-acute home care client nursing charts identifying 94 home care clients receiving wound care in the Saskatchewan health region studied. Following the identification of post-acute home care clients receiving wound care, screening criteria adapted from Sears, Baker, Barnsley and Shortt (2013) were used to capture data on unexpected health symptoms and infection found in the study sample. Table 5.1 reports the proportion of the screening criteria adapted from Sears, Baker, Barnsley and Shortt (2013) identified in the final sample.

Table 5.1 Screening criteria for Post-Acute Home Care receiving wound care adapted from literature

Screening Criteria	Charts positive for criterion	
	n	**%**
Unplanned admission to acute care hospital (excluding transfers for tests, procedures or specialized care not available through Home Care).	0	0
Unplanned visit to hospital emergency departments or walk-in medical clinics.	4	4.26
Patient injury, harm, trauma or complication during Home Care (HC) admission (e.g. falls, fractures, pressure ulcers, skin tears, etc.).	11	11.70
Recognized actual or potential environmental risks, including patient behavioural, physical environment (e.g. risk items documented on risk assessment from or in notes in patient record).	10	10.64
Admitted to HC with infection.	23	24.47
Acquired infection/sepsis confirmed in the nursing chart.	8	8.51
Unplanned admission (including readmission) to HC within 6 months after discharge from index admission.	3	3.19
Unexpected death.	0	0
Dissatisfaction with care documented in the patient record and/or evidence of complaint lodged (including documented complaint, conflict between patient /family and staff, discharged against HC advice).	1	1.06
Adverse drug reaction or medication error (identified by medication reconciliation HC visit).	1	1.06
Adverse event reported by caregiver (e.g. notation of discussion with case manager or service provider).	0	0
Documentation of correspondence indicating litigation, either contemplated or actual.	0	0
Equipment difficulties.	5	5.32

Screening criteria adapted from: Sears, N., Baker, G.R., Barnsley, J., & Shortt, S. (2013)

5.5.2 Participants

On average, post-acute home care clients included in the sample received 21. 91 TCH (*SD* = 21.42). Examination of the number of visits received by post-acute home care clients with wound care indicated client visits ranged from four to 253 visits (*Mdn* = 33) and the number of nurses seen ranged from two to 47 (*Mdn* = 15). In addition, frequency analysis revealed the majority of post-acute home care clients in the final sample were discharged directly to home care and received supportive care (Table 5.2).

Table 5.2 Percent distribution of sample characteristics (*n* = 94)

	Percentage (%)	***n***
Type of admission		
Regular (i.e. uninsured supportive home care)	19.1	18
Short-term Nursing (i.e. 14 days of insured supportive home care)	80.9	76
Type of care		
Palliative	4.3	4
Acute	35.1	33
Supportive	60.6	57
Hospital discharge		
No	30.9	29
Yes (directly to Home Care)	57.4	54
Yes (within prev 30 days)	11.7	11
Seniors housing		
No	89.4	84
Yes	10.6	10
Support rating		
No support	4.3	4
Stable: usually/always available	40.4	38
Stable: limited availability	52.1	49
Unstable	3.2	3

Table 5.3 reports the percent distribution of demographic data collected on post-acute home care clients receiving wound care included in the final sample. The ages of post-acute home care clients ranged from 19 to 92 (*M* = 59.83, *SD* = 17.61) with the ages of female clients ranging from 19 to 92 (*M* = 61.68, *SD* = 16.66) and the ages of male clients ranging from 20 to 89 (*M* = 56.97, *SD* = 18.85).

Table 5.3 Percent distribution for client demographic data (*n* = 94)

		Percentage (%)	*N*
Age groups			
	< 35	10.6	10
	35-49	12.8	12
	50-64	30.9	29
	65-75 yrs. of age	25.5	24
	>75 yrs. of age	20.2	19
Gender			
	Male	39.4	37
	Female	60.6	57
Education			
	Some Elementary School	5.3	5
	Elementary School	3.2	3
	Some High School	10.6	10
	High School	34.0	32
	Post-secondary Training	16.0	15
	University	16.0	15
	Masters	4.3	4
	PhD	2.1	2
Marital status			
	single	28.7	27
	married	57.4	54
	Widowed/Separated/Divorced	13.9	13
Living arrangement			
	lives alone	28.7	27
	with spouse only	45.7	43
	with spouse & other	9.6	9
	with spouse & others	11.7	11
	with caregiver family member	4.3	4

5.5.3 Infection identified through clinical signs and symptoms following post-acute home care admission

The screening criteria used in the first phase of the nursing chart review identified 23 (24.47%) clients receiving wound care were admitted with infection. When reporting the proportion of post-acute home care clients with clinical signs and symptoms of possible and acquired infection post-admission, the participants who were admitted to home care with infection were removed, leaving a sample size of 71. Following removal of all post-acute home care clients receiving wound care admitted to home care with infection, evaluation of the nursing charts using clinical signs and symptoms of possible and acquired infection revealed eight (11.27%) post-acute home care clients receiving wound care displayed clinical

signs and symptoms congruent with possible infection. Similarly, evaluation of the client nursing charts for post-acute clients receiving wound care revealed 14 (19.72%) clients displayed clinical signs and symptoms congruent with acquired infection, after being admitted to home care.

5.5.4 The effect of screening criteria on Total Care Hours

Evaluation of the effect of the screening criteria reported in Table 4.1 revealed post-acute home care clients with wound care who were admitted with an infection and those who experienced injury trauma or harm while receiving home care were statistically significant predictors of the Log of TCH in the study sample. Post-acute home care clients admitted to home care with an infection received approximately 77.9% (β = .779; p < .000) more TCH than post-acute home care clients who were not admitted to home care with an infection. Post-acute home care clients with wound care who experienced a one unit increment increase in injury, trauma or harm while admitted to home care received approximately 53.3% (β = .533; p = .033) more TCH than post-acute home care clients who did not experience injury, trauma or harm while receiving home care.

5.5.5 The effect of possible infection and infection on Total Hours of Care

Evaluation of the effect of possible and acquired infection on the Log of TCH revealed acquired infection to be statistically associated with the dependant variable. Post-acute home care clients identified to have acquired an infection using clinical signs and symptoms after being admitted to home care received approximately 70.2% (β = .702; p = .011) more TCH than did post-acute home care clients who were not identified as having an acquired infection using clinical signs and symptoms reported in the nursing charts post-admission.

5.6 Discussion

The present investigation examined unexpected health symptoms, complications and infection among post-acute home care clients receiving wound care and their effect on Total Care Hours. Evaluation of the nursing charts revealed 24.5% of post-acute home care clients receiving wound care in the final sample were admitted to home care with an infection. Following removal of post-acute home

care clients admitted to home care with an infected wound, 11.3% of post-acute home care clients receiving wound care displayed clinical signs and symptoms congruent with possible infection post-admission. On the other hand, 19.7% of post-acute home care clients receiving wound care displayed clinical signs and symptoms congruent with infection acquired after being admitted to home care.

Evaluation of TCH received by post-acute home care clients admitted with an infected wound revealed a statistically significant effect. Post-acute home care clients admitted with an infected wound received approximately 77.9% more TCH than did post-acute clients admitted to home care without infection. A one increment increase in injury, trauma or harm experienced by post-acute home care clients receiving wound care was also found to be statistically related to a 53.3% increase in TCH. Post-acute home care clients with wound care identified to have acquired an infection while in home care were found to receive more TCH than post-acute clients who did not acquire an infection while in home care. Post- acute home care clients with wound care identified to have acquired an infection after admission to home care received approximately 70.2% more TCH than post-acute home care clients with wound care who did not acquire an infection during the course of care.

These results suggest when making administrative decisions and allocating resources, post-acute home care clients who acquired infection or were admitted to home care with infection require dynamic care plans that track the healing process. Addressing the dynamic care requirements of post-acute home care clients reviewing wound care will facilitate the identification of home care clients who need rehospitalisation and allow for the development of strategies to ensure the appropriate level of care and duration of service provided to post-acute home care clients with wound care. The results also suggest continuity of post-acute care was compromised as post-acute home care clients receiving wound care were identified as seeing a median number of 15 nurse providers. Consequently, increasing continuity of care may offer the potential to reduce TCH required by post-acute home care clients receiving wound care (O'Brien-Pallas et al., 2001).

Given the significant variation in the care reported and post-acute home care client progress evidenced in the nursing charts for clients receiving wound care there is a need to develop standardised

methods for charting patient data. Standardising client data recorded would facilitate a better understanding of intervention outcomes and the progression of client care (Keenan, Yakel, Tschannen, & Mandeville, 2008). Further, standardised methods of charting patient data will make it possible to accurately identify the need for rehospitalisation, referral to allied health services, and necessary changes in client care plans to address lack of healing and the occurrence of adverse events. When developing standardised methods for charting patient data, charts must also be designed to effectively report client status and wound progression, as well as provide an indication of care needs and steps taken to resolve problematic aspects of care.

In addition to developing standardised charting protocols, given nurse providers independently deliver care to post-acute home care clients in the community without the benefit of institutional support, nurse managers and educators must also have the means to support staff dealing with complex cases. As such, it is important for nurse managers and educators to increase their level of engagement with staff by periodically accompanying nurse providers on client visits and reviewing nursing charts (Graban, 2012). Engagement with staff will facilitate an understanding of staff workload, support for staff dealing with challenging situations and identify in-service training needs. A greater involvement of nurse managers and educators will also contribute to a positive work culture. To improve the quality of care there is also a need to establish a direct line of communication for nurse providers to access support when difficult situations arise. Accordingly, it would be beneficial to develop designated procedures and methods for nurse providers to acquire necessary client care information, obtain supplies when in the community, and report untoward events in real -time. The development of a nursing care helpline and implementation of electronic charting using tablets offers the potential to achieve this goal (Lubinski & Barr, 2003).

Development of a nursing care helpline would provide the opportunity to increase quality of care through consultation with nurse educators when dealing with difficult wounds, allow for peer commensuration and advice when wounds are not healing, or access assistance when unexpected situations arise. The use of tablets offers the opportunity to chart in real-time, which is more accurate than the present routine where the majority of charting is done at end of day. Using tablets also provides access

to wound care protocols, video demonstrations and best practice guidelines that would enhance the ability of nurse providers to deliver effective care (Chen, Garrido, Chock, Okawa, & Liang, 2009). Further, tablet computers have the potential to increase collaboration in care by linking the home environment virtually by video to care specialists when nurse providers are dealing with challenging aspects of care.

In order to better understand the influence of possible and acquired infection among post-acute home care clients receiving wound care there is a need to address the limitations of this study. Specifically, this research was limited by the lack of standardisation in charting patient data and the subsequent variation in detail recorded by nurse providers pertaining to progression of care. Future research should strive to obtain accurate person-time data to calculate possible and acquired infection incidence rates. There is also a need for future research to identify the influence of informal caregivers and the home environment on possible and acquired infection. Finally, insight could be gained by comparing the rates of possible and acquired infection among post-acute home care clients receiving wound care across provinces. However, the lack of standardisation in provincially delivered home care programs makes comparison difficult at this time (Canadian Home Care Association, 2013). This is due in part to differences in home care charting requirements, as well as provincial home care regulations, guidelines and goals.

5.7 Conclusion

Hospital discharge policies adopted in the 1990s, to attain public sector cost-savings, have led the Canadian healthcare system to become increasingly reliant on home care services (Canadian Home Care Association, 2013; Canadian Home Care Association, 2008; Premiers Council of Canada, 2002; Jackson, 1994; Hollander, 1994; Jacobs, Hall, Henderson, Nichols & 1995; Coyte & McKeever, 2001; Woodward, Abelson, Tedford, Hutchison & 2004; First Ministers of Canada, 2003).

Discharging patients from acute hospitalisation early to recover at home and in the community may result in patients who have not completely healed accessing post-acute home care. As pbost-acute home care clients frequently require wound care, there is a need to better understand the factors

contributing to infection and infection rates among this sub-population. Since the goal is to improve quality of care provided to post-acute home care clients, standardised charting protocols that accurately convey need for rehospitalisation, referral to allied health services, lack of healing, adverse events, as well as possible and acquired infection must be developed. Also, it is important that client information be charted in real -time. Implementing standardised charting recorded at point of contact would benefit all home care clients. However, these changes to care delivery cannot be accomplished without reconceptualising how home care is provided.

Removing impediments to standardised charting and real -time reporting means home care must develop strategies and methods to support nurses in the community. The goal should be to implement electronic charting using tablet computers (Bresnick, 2014). The use of tablet computers for charting would improve the accuracy, reliability, validity and usability of client data (Iron, & Manuel, 2007). Also, encouraging nurse managers and educators to engage staff regularly by reviewing nursing charts and periodically accompanying nurse providers on client visits, will foster a positive work environment, enhance communication and increase quality of care (Graban, 2012). Implementing these recommendations will foster a deeper understanding of how possible and acquired infection influence the duration and intensity of home care services. Addressing the existing shortcomings and aligning the goals of post-acute home care with the philosophy of continuous improvement has the potential to increase the efficacy and contribution of home care in the mix of services provided to patients in the Saskatchewan Health Region studied.

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Chapter 6

Dissertation Discussion

Emphasis on providing care at home and in the community rather than in hospital makes evaluation of quality of care difficult because of the independent nature of home care service delivery, increasing complexity of home care services and lack of readily accessible physician and institutional support (Auditor General of Canada, 2002; Canadian Home Care Association, 2013; Canadian Home Care Human Resources Study, 2002; Fireman, Bartlett, & Selby, 2004; Laporte, Coyte, & Cruxford, 2002; Leatherman & Sutherland, 2004; McGlynn et al., 2003). At the same time, the goal to address lengthy wait times through the Saskatchewan Surgical Initiative makes these services important as home care services support the objective to increase capacity for early discharge from hospital, prevention of re-admission and avoidance of imminent admission (Saskatchewan Ministry of Health, 2010). In light of the increasing number of clients receiving post-acute home care and the strategic emphasis of the Saskatchewan Ministry of Health, the purpose of this research was to evaluate the post-acute Direct Services Home Care program using: survey data collected from home care clients and nurses at three points in time; administrative data; and a review of nursing charts for post-acute home care clients receiving wound care.

6.1 *Summary of Research Findings*

Post-acute home care client and nurse provider surveys revealed a significant difference between clients' and nurses' reports of hazards and safety plans identified in the clients' homes. The functional status and injury avoidance scores of post-acute home care clients increased over time. Clients, at all three points in time, consistently rated the quality of care to be higher than nurse providers. Surveys identified that the overall quality ratings of home care clients are influenced by the perception of patient centeredness and that overall quality ratings decreased following unexpected symptoms/health complications. Conversely, patient centeredness, service outcome, team communication, functional status and injury avoidance influenced nurse provider quality of care ratings.

Evaluation of the administrative data revealed continuity of care was compromised as patients routinely saw multiple nurse providers while receiving post-acute home care. General Linear Models of the dependent variable Log of Total Care Hours (TCH) suggested post-acute home care clients referred from Emergency Departments, Surgical wards and Cardiology received significantly more TCH than post-acute clients referred from the community. After controlling for post-acute home care client referral source, single post- acute home care clients were found to have received approximately 62.5% more TCH than their married counterparts. Post-acute home care clients with the comorbidity of cancer were found to receive approximately 46.4% fewer TCH than clients without the comorbidity of cancer, while clients with respiratory comorbidities received approximately 89.0% more TCH than clients without respiratory related comorbidities.

The nursing charts revealed 24.5% of post-acute home care clients receiving wound care were admitted to home care with an infection. Following the removal of these clients, 11.3% of post-acute home care clients receiving wound care displayed clinical signs and symptoms congruent with possible infection post-admission, while 19.7% displayed clinical signs and symptoms congruent with acquired infection after being admitted to home care. General Linear Models of the dependent variable Log of TCH revealed post-acute home care clients admitted with an infected wound received approximately 77.9% more TCH than their counterparts. A one increment increase in injury, trauma or harm experienced by post-acute home care clients with wound care was also found to be related to an approximate 53.3% increase in TCH. On the other hand, post- acute home care clients with wound care identified to have acquired an infection post-admission using clinical signs and symptoms documented in the their nursing charts received approximately 70.2% more TCH than their counterparts.

6.2 *Implications*

The implications of this research suggest there is room to improve post-acute home care services to address client re-hospitalisation, unexpected health symptoms/complications, and wound care. There is also a need to better address the six dimensions of quality articulated by the Institute of Medicine (IoM):

safety, effectiveness, patient centeredness, timeliness, efficiency and equity (Institute of Medicine, 2001; Mattke, Epstein & Letherman, 2006). The formative program evaluation of the post-acute Direct Services Home Care program suggested TCH could be extended to 97 days or more for clients requiring complex nursing services, which would cover 50% of the sampled population. This would also contribute to efficiency and effectiveness post-acute care through appropriate service duration to clients with complex needs. Differences between client and nurse provider reports of hazards in the client home and established safety plans suggest nurses may not be effectively communicating with their clients. This implies a need to foster a culture of safety and patient centered care, as discussed in the 2009 Patient First Review (Dagnone, 2009). Providing home care nurses with additional training directed towards improving client communication skills will serve to develop and increase a culture of patient centered care.

Since the goal is to improve the effectiveness of post-acute home care services in Saskatchewan it is important to increase continuity of care which could help to reduce the TCH received by home care clients and encourage the delivery of appropriate care tailored to client needs (O'Brien-Pallas et al., 2001). Improving the quality of post-acute home care also necessitates developing administrative data to its full potential, which would strengthen program effectiveness by increasing the ability to make informed decisions. This implies establishing data fields to differentiate between home care client groups according to the care received. It also means when entering nurse provider visits into the administrative database the actual time of visit should be recorded rather than grouped and entered at one time point. These goals are best accomplished in real-time using tablet computers which also provide the ability to accurately time each visit. Additionally, all generally-used data should be routinely and systematically evaluated, with the understanding that interpretation of data quality is user defined and dependent on the purpose for which the data are collected (Iron & Manuel, 2007). Available administrative data collected should also be designed to mesh with other primary care data currently existing in the health region. This would facilitate a deeper understanding of the interdependent relationships between community care and healthcare; thus providing important linkages to effectively use healthcare data. A deeper understanding

of the interdependent relationships between community care and healthcare would also serve to inform equitable service.

Administrative data must also be regularly assessed for data quality beginning with a clearly defined and explained purpose prior to commencing assessment. The regular assessment of administrative data will contribute to a better understanding of the association between age group, marital status, comorbidities and delivery of appropriate intensity and duration of care received by post-acute home care clients. It will also support the development of Electronic Medical Records and lead to efficiencies in workflow as staff time is redeployed; improve health outcomes and patient safety through preventive care and chronic disease management; and improve interactions and communication among care team members (PwC, 2013). These activities would also enhance the accuracy, reliability, validity, linkability, timeliness, usability, and temporal consistency of home care nurse administrative data (Iron, & Manuel, 2007).

To improve the quality of post-acute home care services it is important to implement an electronic health record system with integrated client charting that requires nurses to report client information in real -time at point of contact (Bresnick, 2014). However, this cannot be accomplished without reconceptualising how home care is delivered. To start, removing impediments to providing quality care and real -time reporting means home care must develop strategies and methods to support nurses in the community. As such, there is a need to establish a direct line of communication for nurse providers to access support when encountering difficult situations. Therefore, it would be beneficial to establish designated procedures and methods for nurse providers to acquire necessary client care information, obtain supplies when in the community, and report untoward events in real -time. One way to accomplish this is the development of a nursing care helpline and implementation of electronic charting using tablets (Lubinski & Barr, 2003).

Incorporating the use of tablet computers would allow nurse providers the ability to access protocols/demonstrations/best practices to assist with care (Chen, Garrido, Chock, Okawa, & Liang, 2009). Development of a helpline for home care nurse providers offers the opportunity to increase quality

of care through consultation with nurse educators when dealing with difficult wounds that are not healing, access assistance when encountering unexpected situations and procure needed supplies. Moreover, developing appropriate pathways for nurse providers to communicate will address the wider goals of patient centeredness, quality of care and stewardship of resources within the philosophy of continuous improvement, as well as contribute to the full integration of home care in the mix of services provided to patients in Saskatchewan health regions.

It is essential to develop standardised charting protocols that accurately convey health related data and ensure understanding of the care plan and support clinical decision making. However, developing standardised protocols for charting patient data requires the implementation of processes to identify changes in the care environment and methods for continuous improvement. It also necessitates the use of standardised evaluative tools. In the context of post-acute home care, this means obtaining the necessary licencing to use the interRAI Acute and Post-Acute Care system (InterRAI, 2014) developed to identify older and disabled persons admitted to acute hospitals with conditions that may benefit from comprehensive specialist assessment and to support care in rehabilitation or specialist geriatric units.

Improving quality of post-acute home care necessitates nurturing a positive work environment and culture. This requires a greater level of engagement from nurse managers and educators. Increasing the level of engagement with home care staff will encourage cross-communication within and between home care managers, educators and nurse providers who independently deliver care in the community; as well as breaking down health care silos. Fostering communication and a positive work environment also creates a culture of transparency leading to solutions to systemic problems, and shepherds greater integration of home care with primary health care.

6.3 *Conclusion*

Continued evaluation of post-acute home care services necessitates objectives, principles and service goals be identified and thoroughly tracked. It is also important to further develop indicators of re-hospitalisation and infection to better support the identification of post-acute home care client care needs.

Improving the quality of home care should not simply involve healthcare practitioners. The client and their informal care providers, as well as the community must also be heard and included in the decision making process (Harrison & Verhoef, 2002).

Home care in Saskatchewan needs to redesign itself to accommodate the vision of patients and clients as an integral component to quality improvement. The challenge in doing this, for home care, is to thoroughly define and identify ways to facilitate the smooth transition of clients from primary care facilities to the community, while accommodating growing numbers of clients with complex care needs. Effectively accommodating clients in the community recovering from acute illness or hospitalisation would allow home care to increase its value to the health care system without increasing overall expenses. However, to accomplish this goal when collecting home care data, there is a need to shift from an emphasis on service based information, towards collecting data on individual home care clients (Scottish Government, 2010). This would improve the understanding of all aspects of community care and contribute to evidence based decision making, as well as allow for more robust accountability frameworks to support the growing importance of home care within the context of primary care delivered in Saskatchewan.

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Appendix B

Study Instruments and Ethics Approval

Evaluating Home Care Client Outcomes

Dear Clients – The purpose of asking you to respond to this brief set of questions is to ensure that home care services are effective in meeting your needs. To get a comprehensive perspective, nurses are also asked the same questions

				Not at all	Partially	About halfway	Mostly	Completely
Do you have a safety plan in place?	N ☐ ↓	Y ☐	If yes, how well do you follow it?	[ ]	[ ]	[ ]	[ ]	[ ]
Has home care staff identified hazards in your home or apartment?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Have you contacted other health service providers (i.e. physician, specialist, and physiotherapist)?	N ☐ ↓	Y ☐ →	If yes to what extent were your care need met?	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
All the necessary supplies were available to home care staff to provide care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Home care staff asked you about how you were feeling.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Home care staff discussed and explained the care process	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The services provided by home care met my care needs.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had complications while receiving services from home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I was hospitalised while receiving services from home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The services provided by home care were interrupted due to staff scheduling/absenteeism or work load.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I discussed everything I wanted with home care staff.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I trust my care providers.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How would you assess your overall health status?

Don't know	Very frail	Frail	Somewhat frail	Somewhat hardy	Hardy	Very Hardy
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
I am able to remain safe (i.e. avoid injury) when in the community.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to remain safe (i.e. avoid injury) when home alone.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to maintain my apartment or home on my own (do laundry & cleaning).	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to perform personal care activities on my own.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to prepare my own meals.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to see friends and acquaintances when I want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to see family and relatives when I want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Having considered the care plan, resource constraints, and the care that has been provided to you, please indicate your assessment of the OVERALL QUALITY of care provided, *using the following standards.*

(0 =non-functional; 10 to 40=terrible to poor; 50-60=passable or adequate; 70-90 =good to excellent; 100= perfect):

Don't know	0	10	20	30	40	50	60	70	80	90	100

Demographics

For what reasons were you in hospital?

Are you:

Male [ ]

Female [ ]

What is your age?

Evaluating Home Care Client Outcomes

Dear Clients – The purpose of asking you to respond to this brief set of questions is to ensure that home care services are effective in meeting your needs. To get a comprehensive perspective, nurses are also asked the same questions

				Not at all	Partially	About halfway	Mostly	Completely
Do you have a safety plan in place?	N ☐ ↓	Y ☐	If yes, how well do you follow it?	[ ]	[ ]	[ ]	[ ]	[ ]
Has home care staff identified hazards in your home or apartment?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Have you contacted other health service providers (i.e. physician, specialist, and physiotherapist)?	N ☐ ↓	Y ☐ →	If yes to what extent were your care need met?	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
All the necessary supplies were available to home care staff to provide care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Home care staff asked you about how you were feeling.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Home care staff discussed and explained the care process	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The services provided by home care met my care needs.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had complications while receiving services from home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I was hospitalised while receiving services from home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The services provided by home care were interrupted due to staff scheduling/absenteeism or work load.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I discussed everything I wanted with home care staff.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I trust my care providers.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how your health has changed since the last assessment *using the scale provided*?

Don't know	Very frail	Frail	Somewhat frail	Somewhat hardy	Hardy	Very Hardy
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
I am able to remain safe (i.e. avoid injury) when in the community.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to remain safe (i.e. avoid injury) when home alone.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to maintain my apartment or home on my own(do laundry & cleaning).	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to perform personal care activities on my own.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to prepare my own meals.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to see friends and acquaintances when I want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I am able to see family and relatives when I want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Having considered the care plan, resource constraints, and the care that has been provided to you, please indicate your assessment of the OVERALL QUALITY of care provided, using the following standards.

(0 =non-functional; 10 to 40=terrible to poor; 50-60=passable or adequate; 70-90 =good to excellent; 100= perfect):

Don't know	0	10	20	30	40	50	60	70	80	90	100

Is there any other service that would help you to remain in your own home?

Demographics

For what reasons were you in hospital?

		Are you:	**What is your age?**
		Male	
		Female	

Evaluating Home Care Client Outcomes

Nurses – The purpose of asking nurses to respond to this brief set of questions is to ensure that home care services are effective in meeting the needs of their clients. To get a comprehensive perspective and clients are also asked similar questions

				Not at all	Partially	About halfway	Mostly	Completely
Were physician orders available?	N ☐ ↓	Y ☐ →	If yes, how did they meet the clients needs?	[ ]	[ ]	[ ]	[ ]	[ ]
Does the client have a safety plan?	N ☐ ↓	Y ☐ →	If yes, how well is it being followed?	[ ]	[ ]	[ ]	[ ]	[ ]
Were hazards in the client's home or apartment identified?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Did the client have complications while receiving home care?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Was the client hospitalised while receiving home care?	N ☐ ↓	Y ☐ →	If yes, to what extent were the problems resolved?	[ ]	[ ]	[ ]	[ ]	[ ]

Given your workload please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
All the necessary information for therapeutic decisions (i.e., chart & care plan) was available.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
All the necessary supplies were available to provide care to this client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had the time to listen to everything the client had to say?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had the time to observe all of the clients' symptoms?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
There was time to discuss and explain the treatment process with the client?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
All of the clients needs were met by the services provided by home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Communication between care providers has been sufficient to provide services to the client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Provision of care to this client been interrupted due to staff scheduling/absenteeism or work load.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I have developed a trusting relationship with the client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How would you assess the client's overall health status?

Don't know	Very frail	Frail	Somewhat frail	Somewhat hardy	Hardy	Very Hardy
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well your client is able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
The client is able to remain safe (i.e. avoid injury) when in the community.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to remake safe (i.e. avoid injury) when home alone.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to maintain their apartment or home independently (do laundry & cleaning).	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
To what degree is the client able to perform personal care activities independently?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
To what degree is the client able to prepare their own meals?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to see their friends and acquaintances when they want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to see their family and relatives when they want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
In your opinion is the client depressed?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Having considered the care plan, resource constraints, and the care that has been provided to the client please indicate your assessment of the OVERALL QUALITY of care provided, using the following standards.

(0 =non-functional; 10 to 40=terrible to poor; 50-60=passable or adequate; 70-90 =good to excellent; 100= perfect):

Don't know	0	10	20	30	40	50	60	70	80	90	100

Is there any other service that would help the client remain in their own home?

Demographics

Nursing Education (state education)

Nursing Qualification/Certification

RN

LPN

Other Please indicate below

How many years have you been in practice?

What additional training would you like to receive?

Evaluating Home Care Client Outcomes

Nurses – The purpose of asking nurses to respond to this brief set of questions is to ensure that home care services are effective in meeting the needs of their clients. To get a comprehensive perspective and clients are also asked similar questions

				Not at all	Partially	About halfway	Mostly	Completely
Were physician orders available?	N ☐ ↓	Y ☐ →	If yes, how did they meet the clients needs?	[ ]	[ ]	[ ]	[ ]	[ ]
Does the client have a safety plan?	N ☐ ↓	Y ☐ →	If yes, how well is it being followed?	[ ]	[ ]	[ ]	[ ]	[ ]
Were hazards in the client's home or apartment identified?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Did the client have complications while receiving home care?	N ☐ ↓	Y ☐ →	If yes, to what extent were they addressed?	[ ]	[ ]	[ ]	[ ]	[ ]
Was the client hospitalised while receiving home care?	N ☐ ↓	Y ☐ →	If yes, to what extent were the problems resolved?	[ ]	[ ]	[ ]	[ ]	[ ]

Given your workload please indicate how well you have been able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
All the necessary information for therapeutic decisions (i.e., chart & care plan) was available.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
All the necessary supplies were available to provide care to this client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had the time to listen to everything the client had to say?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I had the time to observe all of the clients' symptoms?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
There was time to discuss and explain the treatment process with the client?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
All of the clients' needs were met by the services provided by home care.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Communication between care providers has been sufficient to provide services to the client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Provision of care to this client been interrupted due to staff scheduling/absenteeism or work load.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I have developed a trusting relationship with the client.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how the client's health has changed since the last assessment *using the scale provided*.

Don't know	Decreased a lot	Decreased Slightly	Stayed the same	Improved Slightly	Improved a lot
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate how well your client is able to handle the following activities or issues:	Not at all	Slightly	Partially	About halfway	Mostly	Almost Completely	Completely
The client is able to remain safe (i.e. avoid injury) when in the community.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to remake safe (i.e. avoid injury) when home alone.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to maintain their apartment or home independently (do laundry & cleaning).	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
To what degree is the client able to perform personal care activities independently?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
To what degree is the client able to prepare their own meals?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to see their friends and acquaintances when they want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The client is able to see their family and relatives when they want to.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
In your opinion is the client depressed?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Having considered the care plan, resource constraints, and the care that has been provided to the client please indicate your assessment of the OVERALL QUALITY of care provided, *using the following standards.*

(0 =non-functional; 10 to 40=terrible to poor; 50-60=passable or adequate; 70-90 =good to excellent; 100= perfect):

Don't know	0	10	20	30	40	50	60	70	80	90	100

Is there any other service that would help the client remain in their own home?

Demographics

Nursing Education (state education)

Nursing Qualification/Certification

RN

LPN

Other Please indicate below

How many years have you been in practice?

What additional training would you like to receive?

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

Certificate of Re-Approval

PRINCIPAL INVESTIGATOR	DEPARTMENT	Beh #
Rein Lepnurm	School of Public Health	12-76

INSTITUTION (S) WHERE RESEARCH WILL BE CARRIED OUT

Saskatoon Health Region
Saskatoon SK

STUDENT RESEARCHER(S)

Robert Nesdole

FUNDER(S)

SASKATOON HEALTH REGION

TITLE:

Evaluating Home Care Client Outcomes

RE-APPROVED ON	EXPIRY DATE
30-May-2014	29-May-2015

Full Board Meeting ☐

Delegated Review ☑

CERTIFICATION

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS

In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.usask.ca/research/ethics_review/

Beth Bilson

Beth Bilson, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Please send all correspondence to:

Research Ethics Office
University of Saskatchewan
Box 5000 RPO University, 1607 – 110 Gymnasium Place
Saskatoon, SK S7N 4J8
Phone: (306) 966-2975 Fax: (306) 966-2069